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DECEMBER 1920.

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DETAILED CON[illegible]

MYSORE UNIVERSITY CON[illegible]—
By Sir Leslie Miller, K.T., C.B.E. 710

ECONOMIC PROGRESS IN BARODA—
By A. P. Smith 716

THE MINIMUM OF SUBSISTENCE, MADRAS CITY—
By the Rev. D. G. M. Leith, B.A., Madras 718

THE ECONOMICS OF THE PEACE—A REVIEW—
By I.C.S. 721

STORES PURCHASE COMMITTEES REPORT— 726

COTTON SPINNING MILLS—
By "X." 730

ELEVATING THE PANCHAMA—
By K. S. Chandrasekhara Aiyar, B.A., B.L. 734

SUGAR PRODUCTION IN INDIA— ... 740

BRUSSELS CONFERENCE REPORTS ... 741

ECONOMICS IN THE WEST—
By Arnold Wright 748

INDUSTRIAL NOTES FROM THE U.S.A.—
By Alfred T. Marks 752

NOTES 756

GLEANINGS 761

ECONOMIC NOTES—

INDUSTRIES AND COMMERCE—
Progress in the United Provinces ... 764

FINANCE—
Economic Effects of the War ... 766

CO-OPERATION—
Bombay Provincial Co-operative Conference 767

CORRESPONDENCE 768

BOOKS IN BRIEF 769

ACKNOWLEDGMENTS 771

ADVERTISEMENTS ... i to vi & cover.

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of all Economic Topics of Interest

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MYSORE UNIVERSITY CONVOCATION.

BY SIR LESLIE MILLER, K.T., C.B.E.

[*The following Address was delivered by Sir Leslie Creery Miller, Vice-Chancellor of the University of Mysore, at the Third Mysore Convocation*:—*Ed., M. E. J.*]

YOUR HIGHNESS, LADIES AND GENTLEMEN.—At this the third Convocation since the birth of the University of Mysore I occupy a double position. I am as Vice-Chancellor expected, I understand, to tell you something about the doings of the University in the past year, and I am also a co-member of the Senate or other person nominated by the Chancellor to deliver an address suitable to the occasion. Combining these two capacities, I combine also the two discourses and thereby hope to save for you some of your doubtless very valuable time and to reduce to some extent the strain upon your attention.

I shall not attempt to emulate the moving eloquence of either of my predecessors in this position, nor can I pretend to offer you anything that is new. I shall endeavour to be severely practical, and I shall indent on my predecessors for my texts. I shall by no means expatiate free over all the range of educational ideals, projects and problems, a mighty maze of which I cannot pretend to have devised or even to possess a plan. I should have liked, had time permitted, to have made an attempt with the help of the charts supplied by my two predecessors, to measure to some extent the progress we have made in the short time that has elapsed since we put to sea. But as it is, two points and two only do I propose to emphasise: one I shall put before the people of Mysore and the other I shall on behalf of that people, present to my young friends the new graduates of the Mysore University. *But of these* a little later.

In the latter part of the past academical year the shadow of mourning has darkened the University. The death of the First Vice-Chancellor has deprived her of a very faithful friend—who sat by her cradle, a zealous, loving nurse; and helped to guide her infant footsteps on her appointed path—a genial, kindly gentleman. In the deliberations of the Council we greatly miss his gentle guidance, and his complete knowledge of the details of all the subjects that came before us.

He has bequeathed to the University two tokens of his good will: a prize to be competed for by men and a prize to be competed for by women, tokens which amid many other things will serve to keep his memory green when all of us who knew him and who mourn his loss, shall have followed him.

Another zealous friend Mr. Thomas Denham has left us but happily still lives to watch with interest and sympathy our efforts and our successes; and doubtless to lend us,

if need be, a helping hand from time to time.

I have not much to say about the year's events. Our students have increased in number by some 100 men and in the present year which commenced on the 1st of last July we have been faced with the problem of finding place for more candidates than we can easily accommodate. When our young men are urged to turn to the study of science and technical knowledge, it is incumbent upon us to provide for those who accept the invitation: and how to do this, is one of the questions which require solution early.

But if young men are clamouring at our doors that is not the case with young women. For them we are still waiting. It may be that we are at fault: that we do not provide sufficiently varied 'attractions' if I may so phrase it: that we ought to increase the number of the courses of study: that is obviously a matter mainly of expense. The problem from this point of view is to provide the necessary attractions at the minimum cost. It is not insoluble, I dare say, but I am not attempting to propound the best solution for one thing because it is clear to me that even with the restricted curriculum at present available to students of the Maharani's College, there ought to be in that College a far greater number of students than at present there are—I do not seek to fix the blame for that, but I am sure the University cannot be held to be mainly, if at all, in fault.

Our endowments are steadily, if slowly, increasing: in the past year some Rs. 4,500 have been added to the total, and since then two other gifts have been offered, one of Rs. 1,000 by a gentleman of Saklespur for a medal, and one of Rs. 5,000 by Mr. P. Raghavendra Rao also for medals in memory of his father Mr. P. Krishna Rao. These await only formal acceptance and final settlement of the conditions of award. For all these contributions the University cannot

I believe I am fully justified in saying that throughout the year the Government, the Senate and the Council have done all that seemed to them possible to help the University on the path of progress on which it has so recently started; but over all this endeavour has hung the cloud of poverty. "Postponed for lack of funds" has seemed to me, since I was asked to do the duty of Vice-Chancellor, to be the fate of all or nearly all the schemes suggested for expansion and development. Bid me not revive the *infandum dolorem* of those disappointed efforts of ours. Are they not written in the records of our Senate and Council meetings and the proceedings of the Government in the department of education and agriculture? There let them lie till times are more propitious. A kindly pat on the back by Sir Michael Sadler and some of his learned colleagues have assured us that our start has been good, that our constitution is framed on the approved lines; and my successor and the Council has now to consider with the help of an analysis, full of suggestion made for them by Mr. Denham, the report of Sir Michael Sadler's Commission so far as it presents features, ideas, methods which may be found suitable for adoption here. It is probable, nay certain, that some changes may be found desirable and naturally we shall be found to have made some miscalculations. I do not myself believe that any change which the new Vice-Chancellor and the Council will be able to suggest will render the administration less expensive, and it follows that so long as 'financial stringency' is with us we shall be hard put to it to do any of the many things which even now seem to us desirable.

The process of cutting our coat according to our cloth is simple enough and satisfactory enough if the material is plentiful; it becomes a difficult and somewhat disheartening task when the supplies of the cloth are insufficient to meet our demands: our aim is to turn out a really useful, comfortable and

newest improvements and adornments; and I do not doubt that even with the material now at our disposal we shall, given plenty of time, achieve a very creditable result, but if we are to be delayed till the period of financial stringency shall have waxed and disappeared, our progress is likely to be very much slower than we or most of our well-wishers desire.

On the one hand we have eager insistent voices, anxious and rightly anxious to provide for the youth of Mysore of both sexes, the opportunity of studying in their own University all the branches of knowledge which they desire to acquire: one urging us to furnish our coat with an agricultural swallow tail, another insisting on a medical cape, others suggesting full legal pockets or a musical and artistic collar and cuffs, and beside all these, we have still in our ears the voice of Sir Ashutosh Mookerjee bidding us "Forget not that education is the one subject for which no people has ever yet paid too much."

On the other hand we have the Government holding in trust for the people the monies gathered mainly from the people, bidding us be patient, handing out to us such quantity of material as they believe they can rightly spare for us, and bidding us make the best of it. "We know," they will tell us, "that education is the most important, as it is also the most importunate, of the departments over which our funds are to be distributed, and we may accept Sir Ashutosh Mookerjee's statement that if the history of civilization be explored it will be found that "The people who provided the greatest educational opportunities were always the most wealthy, the most powerful, the most respected, the most secure, in the enjoyment of every right of person and property."—We observe, however, that he speaks of 'peoples' not of 'Governments' and we should like some of those who have accepted his invitation to explore the history of civilization to inform us whether the proportion of the revenues facilities by the Governments of those 'peoples' was greater than the proportion spent by us to-day. "We recognise," they may say, "That if ever the time comes when our weapons can be cast away or beaten into plough shares and pruning hooks that time will come through the spreading of knowledge, and we recognize that in the spreading of knowledge the University is one of the most important and effective agents which we can employ, but the time is not yet, when our policemen can be beaten into school-masters, our magistrates and judges turned into professors, our courts and our jails 'scrapped' or converted into libraries and lecture halls. For the present, you must be content to take your share of the revenues and that share shall be as great as we can make it with due regard to the requirements of our other necessary if less important services." That is reasonable enough, right enough. But the result is that the University fails to obtain the necessary subsistence. So far from being able to expand, so far from being able to inaugurate more courses of study in new branches of learning, or higher courses of study in those already taught, we find ourselves unable solely from lack of money to do all that ought to be done to provide for the courses which already are set out in our Calendar. I have already referred to one or two facts, which show how we are situated. Our students have increased in number by about 100, and in July last for 40 seats in the Engineering College there were 180 candidates—some from outside the State of Mysore—and it was, I think in the month o July last that one of my colleagues and I leav ing the court at about half-past two in th afternoon to enjoy a brief half hour of doubtless well-earned rest were to our surpris escorted through the corridors by a numerou band of young men, obviously students. I was not the pattern of our gowns they cam out for the study: it was not the silver gleam of the maces borne before us th

number of honest lads who had qualified themselves for admission to the University and were come to ask the Vice-Chancellor to help them to obtain seats in the Central College—where there was no room for them. What help was possible had in fact already been given by others. The Principal of the College had already made the best possible arrangements for the applicants and the Government readily sanctioned the necessary expenditure. So far so good, but these things are a warning. If we are likely to find increasing difficulty in providing for the accommodation of would-be University students what becomes of the proposition, put forward two years ago as axiomatic. "All sources of knowledge must be open to all students as they want them"? If the people of Mysore intend to accept this proposition, if they mean to make their University self-contained, if they desire that the young men and women of this country shall be independent of its recognition, by other universities, for their higher and more specialised post-graduate studies—then they must recognise that there is only one key which can effectually lay open the sources of knowledge and that key is a key of gold; and they must make up their minds to help in the making of that key. For it has to be remembered that every student entering our halls is a source of expense no less than of pride to us. We cannot increase the number or the strength of our classes without increasing the staff of our teachers; it may be that a pleasant path in a shady grove may suffice as a lecture hall for the inspired exponents of philosophical systems; a platform under a pipal tree may do for the students of history; but for those who seek to study science under modern conditions, there is more to be done; delicate and costly apparatus, specially designed and constructed lecture rooms and laboratories, all have to be provided in sufficient quantity, and none can be provided without a large

report of the address given at the Convocation of last year by my friend and sometime colleague, Sir Abdur Rahim. What does he say about it? "I have not the least doubt that the citizens of this State are proud to have a University of their own. May I not also assume that every one will consider it to be his duty to make such contribution as he is capable of, towards its advancement? The rich men of Mysore............will, I earnestly hope, rejoice in having an object, worthier than which there is none, on which to lavish their wealth and treasures. It would be a matter of surprise and disappointment to all if the Mysore University is not richly and abundantly endowed by the munificence of the wealthy sons of the State.

I am afraid our friend, if he has been watching us with the sympathy indicated in his address, must by this time be somewhat surprised and somewhat disappointed. Not that we are ungrateful for the gifts that have been made to us; far from it, but they, so far, are gifts for the provision of rewards to students, very valuable to the University, but not quite what Sir Abdur Rahim meant, I think, by endowment. It may be, I think it is, likely, that we somewhat overestimated the number and perhaps the resources of the wealthy sons of the State. There are probably few whose wealth could enable them to make large contributions to the University: contributions such as the recent gift of £165,000, (say 16 lakhs of rupees) for a school of Biochemistry at the University of Cambridge, may make our mouths water but we do not at present expect a superabundant supply of them from individual citizens of Mysore.

But if the citizens of mysore are really proud of having a University of their own, if they really desire and really mean to establish it firmly on solid foundations with the least possible delay, can they not call in aid

/hat one man cannot do by individual effort, any may accomplish by united endeavour. Surely it is not necessary to lable each ft with the name and style and address of ıme individual donor. Can our citizens not nk their individuality in their corporate ıpacity? Is it not possible for a number f citizens representing some locality, or less esirably, some community, to combine in ontributing an endowment? Can we not .ope to see, let me say, a Senate House ıresented by the citizens of the Mysore City ır of Mysore District? Why should we not ıave a chair of what you will, be it Biology, ır Geology, or History, or Philosophy, or Sanskrit, founded and endowed by the citizens of Shimoga? A Tumkur professor of this, a Kolar professor of that, a Chitaldrug professor of the other? Let but our Cities, Districts, Taluks, Hoblis, and what not vie with one another in bringing gifts for the maintenance and expansion of the young University, which if all be true that is said, they were so eager to establish, and soon we shall feel that we stand firmly on our feet and may venture to increase the length of our stride. Our University is now, as all of you know, not a State-aided but a State maintained institution: it is I venture to think too much dependent on the fluctuations of the public revenues and the requirements of other schemes and projects from year to year. I do not for a moment doubt the good will of the Government. I do not for a moment question its generosity, I do not hope or indeed wish to free the University entirely from Government control or to make it entirely self-supporting without aid from the State. I believe that it is now well established, and I give no heed to the critics who even now from time to time suggest that it is still a costly experiment, liable to be 'scrapped' if I may so express it, at short notice: I believe that it will grow and is growing in strength and in health, that it [illegible] have made to establish and to nourish it, but I believe that it will grow and ripen the better for a greater financial stability, greater financial scope for development, and I see in the gifts of the people the most promising and the best method of hastening the day of harvest. The method at present most in vogue with the citizens that of belabouring the shoulders of authority with the bludgeon of importunity is a method which has its uses and achieves results, but it requires in my view to be supplemented, if not supplanted, by the method I have suggested, whereby the people themselves put the hand of assistance to the plough of endeavour. Thus will they manifest their real interest in their University and go far to ensure the increase in the future of the prosperity and happiness of their country.

If I have wearied you with so long and so 'materialistic' a discourse, it is because I have felt that this is the best opportunity I am likely to get of emphasising a matter of very great importance to the future of the University: and because it seems to me necessary to keep in view the materialistic side of our educational problem, for it is perhaps likely to be a little eclipsed and obscured by other more attractive aspects of it.

Now, I turn to the matter which is the proper subject of the discourse suitable to the occasion which it is my duty to deliver, a word or two to you who have to-day received degress in this hall and I ask you what are you going to do for Mysore—what are you going to do to repay your country and your families for the sacrifices made for you, for the education already given to you and for the education which will, I hope, be given to many of you hereafter, in this University or elsewhere. If the question occurs to you what is the profession in which a young man with a university degree can best serve Mysore at present, I believe that if you give yourselves an honest and sincere answer,

teacher'. Everywhere we hear of the need of education—a few days ago at the opening of the Assembly, I heard the representative of an association of members of what are known as the "depressed" classes deliver a short and interesting address to the Dewan. "What my peoples want of the Government", said he, "is education"; and there are few, if any, communities in Mysore of whom the same thing cannot be said. Well, if that is the universal want, are you going to help to supply it?

The University will open next year a post graduate course for a degree in Teaching, and the Government is even now, I believe, considering a comprehensive memorandum on education and may soon enunciate a suitable and I trust a liberal policy. What that policy may be, I do not know, but I can hardly imagine any enlightened modern policy of education which does not involve the creation or extension of that, "Net-work of well-organized schools" of which Sir Ashutosh Mookerjee spoke two years ago—and each school of that net-work of well-organized schools requires a staff of skilled, trained and competent teachers. So, I venture to think, you will not have any lack of opportunities of obtaining employment as teachers, and there is, I believe, we have agreed, no occupation which affords greater opportunities of doing great and noble work for Mysore. But you will naturally ask how far the adoption of the teaching profession is likely to yield you sufficient fruit. The work may be great, the work may be noble, it will certainly be taxing. Will my reward be as great? Will my prospects be as noble? May I expect adequate compensation for my toil?

Well, for some years now it has, I think, been recognized that the occupation of a teacher is economically productive like that of the engineer and unlike those of the lawyer and the soldier, which in their essence are but necessary evils originating in the unwisdom eminent, wise, voices, insisting on the necessity of attracting to the service of education by the offer of adequate rewards, the best equipped minds and brains, not to say hearts, to be found among the young men and women of the country, if that country is to keep pace with others in prosperity and general well-being.

I do not doubt that the Government of Mysore accept the soundness of the proposition so insistently urged, and it seems to me probable that in a few years' time the educational services of the State will present as many attractions to its members as any branch of the administration, and at least equal opportunities for rising to the highest positions and that not only in their own profession but also in the councils of the State.

But if you think that this prophetic outline is possibly painted in colours somewhat overbright, then will you consider one other aspcet of this matter? Do not we hear all round us the hymns of praise raised to the spirit of service, the spirit of sacrifice? Writers and teachers, lecturers and preachers, join without ceasing in exhorting and adjuring us to turn from our old faiths, to leave the multitude who throng the altars of the spirit of self-help, and join the small band of men and women who through the ages have paid their vows and brought their offerings to the altar of the spirit of service: the few who have been worshippers of that spirit not only with their lips but in their lives. "Trust no more." they tell us, "To the old dogma 'God helps those who help themselves'—dogma born of the age-long cruel struggle for life. 'God helps those who help others' is nearer to the truth. Be not ever busy about your own needs whether material or spiritual. Be not over anxious about your own wealth, your own ambitions, your own comforts, your own souls: seek ye first the service of others, and all these things shall

In all this, of course, there is nothing new; ages the doctrine of sacrifice has been ɜached by teachers of different riligious d philosophical systems, preached it is true, t practised by few of the preachers and v indeed of their bearers. The struggle r life has held the field for long. Is the ne coming when it is beginning to yield? any will tell you "Yes. The spirit of rvice is moving the peoples of to-day and ill spread its influence surely if slowly till e world is filled with its blessings." I hope at may be so, but the point now is this: if ɔu are at all imbued or even slightly tinged ith this spirit of service it should not surely ɜ a very hard thing to live up to it, so to ɔeak, to the extent which I am now suggest-ıg. Even if by the adoption of teaching as profession you cannot hope to attain as reat wealth, as great wordly posi-ion, as great fame, as can be reached in other rofessions, other occupations, still you will ıot starve, your families will not lack food, lothing or shelter, you will not have to beg our bread; can you give up some hope of greater wordly advancement for yourselves, o bring to the service of your fellow country-nen those talents which you have been able, with their aid, to develop? Can you live for the good that you can do rather than for the goods that you can get? It is no small thing to bring light to them that sit in darkness. There are many ways of doing it, no doubt, and I have suggested to you but one and perhaps a very obvious one. It is at your choice. If you can see a better way take it, if not, give mine, I pray you your earnest cosideration. Your University will watch your choice with sympathy and interest and whatever that choice be, I trust that in the fulness of time it will bring to you your hearts' desire.

ECONOMIC PROGRESS IN BARODA

BY A. P. SMITH.

IN January of 1918, an influential Committee of five members was appointed by H. H. the Gaekwar of Baroda for an exhaustive economic survey of the State, and to report on the progress made during the last thirty years, the resources available and suggestions for the development of those resources; and to discuss questions of principle and policy there anent. Suggestions from the public were invited and the result is a report of about 300 pages concerning every department of economic importance.

The opinions expressed by the Committee have been based on a careful enquiry and examination of existing conditions and of the suggestions put forward by Heads of Departments immediately concerned with the economic development of the State.

After a brief note on the physical features of the State and its administrative units, vital statistics, land tenure, growth of industries since 1905, land revenue, wages, etc., in Part. I.—Part II. deals with the steps taken by the State during the last thirty years to develop its economic resources. There is much information in Part I which deserves mention, and a fact of ominous significance is that the controlling factor in the life and subsistence of the people of the State are the periodic rains. If these are seasonal and abundant, the people prosper, but even one years' failure of the monsoon, either in time, or quantity spells practical bankruptcy of the great majority of persons primarily dependent upon agriculture; and such failure involves loss of property and even death. In the words of Aberigh Mackay "Famine is the horizon of the Indian Villager; insufficient food is the foreground" and what it is in all parts of British India, it is also in Baroda. There is no lack of cultivable soil and irriga-

it is something that a few rivers and streams flow throughout the year.

A regrettable fact that does not apply to Baroda alone, is that by the decay and disappearance of the indigenous industries of the State, the people supported by them seek subsistence in agriculture. In ten years, for instance, the fall in industrial occupation is remarkable. In 1901,—and the decay of indigenous arts and crafts had begun many years previously—where 17·9 per cent of persons were engaged in industries of sorts, in 1911 the percentage was 12·30! To make matters worse those who turn to agriculture to obtain a living as a last resort are failures as agriculturists.

One of the obstacles to united effort in any direction is that in a population of about 2 millions in the State there are about 550 castes and sub-castes; not including mahomedans and the depressed classes. Three other cardinal facts are that the average income per head of population is a trifle less than 4 per mensum; that the death rate is high and that, though the birth rate is still high, the average duration of life is very low owing to feeble vitality resulting chiefly from malnutrition. Lastly, although the State has made considerable progress in education, illiteracy characterizes the vast majority of the population. An economic resuscitation, in these circumstances, must necessarily be slow. There is no necessity to review the steps taken by the State during the last thirty years to develop its economic resources. Are they not chronicled in the administrative, Census, Commerce and Industry reports? What is the nature of the recommendations of the committee is a question that is more vital.

In this regard education takes a most prominent place, and the recommendation is that education should be in two branches—rural and urban, and chiefly vocational, while teachers should be specially trained for the purpose. Instruction by illustrated pictures and the library department is also recommended and co-operation and co-ordination between the Commissioner of Education, the Curator of State libraries, the Registrar of Co-operative Societies, the Directors of Agriculture and

Commissioner is essential for drawing up a programme of work. The Committee lay stress on the necessity of spreading the knowledge of hygiene. Another recommendation refers to the relief of congested areas and habitations, and the selection of sites for extending villages. Under Agriculture, the Committee's recommendations deal with every aspect of the occupation that employs about 80 per cent of the population of the State, including Agricultural indebtedness, Co-operation, Land Rights, the training of local leading men in civics, agricultural problems, the diminution of drink, as a preliminary to its entire abolition, cottage industries, tenancy legislation and so on. A Forest policy practically similar to that pursued in British India is advised. As regards industries, the measures recommended are all worthy of attention and this *Journal* has already recorded work that has been done by the Commerce and Industries Department. Finally, the Committee make several valuable suggestions to afford the people engaged in Agriculture and Industries financial facilities. Of the making of books there is no end and much study is a weariness to the flesh and the Baroda Economic Development Committee has achieved a success in the formidable task entrusted to them for investigation. It is probable that their exhaustive of the problems has been wearisome, on saying which no reflection is meant in their earnestness or enthusiasm—and it only rests with His Highness's Government to give practical effect to the Committee's advice. Energy, enterprize and Government initiative are necessary to stimulate and encourage the people to awake from the lethargy in which they are stagnating and to become mobile in endeavour. "Reams of hiccoughing platitudes lodged in the pigeon holes of the Home office by all the gentlemen clerks and gentlemen farmers of the world cannot mind"—the conditions of the Indian villager, wrote Aberigh Mackay over 40 years ago. The words quoted apply *mutatis mutandis* to Baroda and other Indian States and despite Reports of sorts and statistics and recommendations, written annually or oftener, unless there is, besides good intention, sustained effort, unsleeping vigilance and fostering care, progress in economic development with an extremely conservative—apart from the other disabilities which have been noted —people must of necessity be impossible

THE MINIMUM OF SUBSISTENCE, MADRAS CITY.*

BY THE REV. D. G. M. LEITH, B.A., MADRAS.

IN these days of difficult economic questions, it seems to me imperative that we should endeavour to fix the minimum of subsistence for the worker in the City of Madras. We are not in this discussion endeavouring to arrange for comfort or luxury. We are not trying to discover what a man needs to be comfortable (a task also important). We are not asking what he requires for the development of his intellectual and emotional and artistic life and for his children. Our task is much humbler. What is the barest minimum required in this City to maintain a man in physical efficiency so that from purely physical point of view he may discharge his duty to the community without that starved furtive look we so often see in the eyes of the Madras labourer to-day. Unless we know this, it is impossible for us to be just in fixing wages. Unless we know this we cannot form an intelligent opinion concerning the labour strikes and lockouts that are much an unhealthy feature of the life of Madras. What is the wage that will provide physical maintenance for a man and his family consisting of a wife and two children?

The task, of course, is no new one. It has been attempted by social and economic students in the West and various books have been published giving the results of the study. Perhaps the best known are those of Mr. Rowntree, his most recent book being "The Human Needs of Labour."

In Madras too a certain amount has been attempted. The Salaries Committee appointed by Government has endeavoured to estimate the daily essential expenditure on food. In 1917 a group of men chiefly young graduates, met at the Kellett Institute, Triplicane, under the guidance of Dr. Gilbert Slater. The aim of the group was to work out a standard by which to judge whether any given family income was sufficient for the physical efficiency of that family, in other words to discover a Living Wage.

The group took the diet prescribed in jail for an adult male prisoner doing hard labour as a basis and found that the cost of food per day for such a person in Madras was two annas 9 pies, making for a month of 30 days—Rs. 5-2-6. It was, therefore, reckoned that Rs. 5 might be regarded as a reasonable allowance for food for a man doing manual labour. Other investigations produced the following results:—

	Rs.	a.	p.
For man for food for month ...	5	0	0
For Wife ,, ,, ...	4	0	0
For two children ,, ,, ...	5	0	0
(N. B.—This was regarded as an average family)			
Rent	1	0	0
Clothing	0	8	0
Fuel	1	0	0
Miscellaneous	0	8	0
Rs. ...	17	0	0

These results were published in the Press and evoked considerable interest and some criticism. But we felt that the criticism did not to any material extent destroy the general correctness of the minimum of subsistence which we had reached.

Conditions have since then tremendously changed. The whole economic position has altered. What is the new standard of minimum subsistence that must now be adopted? Can a new living wage be discovered? We felt we must try.

As in 1917 in determining the amount of food required by a man we have taken the jail diet as standard for the simple reason that that diet has been worked out by medi- ... [illegible] principles as what a man

* ... before the Madras Economic Asso-

requires for physical efficiency when doing hard work. There is the further empirical reason that in point of fact we find that men who live on jail diet are physically strong. I know there are sentimental reasons against it and people argue that a man outside the jail should receive more food than the man inside. But obviously if the man inside the jail has diet which is scientifically correct there is nothing to be gained by a man over-feeding himself merely because he is free from restraint. In taking the jail diet we are able to stand on the rock of scientific accuracy.

Therefore we bought in the bazaar the commodities as suggested in the jail diet as follows:—

1. Ragi Price—$4\frac{1}{2}$ measures per Re. 1/-; but one measures cost-/4/. We found that one measure was equal to 3 lbs. 1/8 oz. that $48\frac{1}{8}$ oz. costs /4/-. . . 15 oz. costs 1 anna 3 pies. Price in 1917, 1 anna.

2. Rice—boiled rice cost was $3\frac{1}{8}$ measure per Re. 1/—in the Triplicane bazaar, *i.e.*, As. 5, pies 4 per measure.

One measure equals 3 lbs 5 3/8 oz. . . 5 oz. (the jail allowance) costs 6 pies as compared with $4\frac{1}{2}$ pies in 1917. I think it is fair to say that as far as I can discover few labourers are willing to buy rice at 3 1/8 measures: they seem to purchase a dearer quality but the cheaper is there and was purchased in the bazaar by Mr. T. J. Kumaraswami who has spent a great deal of time and thought on these investigations and without whose help this paper could hardly have been written.

3. Dholl—$2\frac{3}{4}$ measures can be purchased for Re. 1/—but 1 measure costs As. 6 $\frac{1}{4}$ measure, the amount we purchased cost $1\frac{1}{3}$ annas, and in weight $12\frac{1}{4}$ oz. 5 oz. the amount required in the jail diet therefore costs $7\frac{1}{3}$ pies.

4. Next come vegetables. These are [illegible] jail diet 6 pies can purchase that amount of vegetable according to various investigations. That can therefore stand—though personally I should be inclined to place it 2 pies higher.

5. Oil.—We purchased and weighed $2\frac{7}{8}$ oz. costing 1 anna 3 pies. So that $\frac{1}{2}$ oz. costs $2\frac{14}{23}$ pies say $2\frac{2}{3}$ pies.

6. Tamarind was bought at $\frac{3}{4}$ oz. for 1 pie. $\frac{1}{2}$ oz. the amount in the jail diet costs $\frac{2}{3}$ pies.

7. Salt can be obtained at $1\frac{1}{2}$ annas per measure. $\frac{3}{4}$ oz. costs $\frac{1}{6}$ pie.

8. Curry powder 1/4 oz. works out at 2 pies and onions at $\frac{1}{2}$ oz. equal to $\frac{1}{2}$ pie.

The food per day may thus be sumarised:—

			As.	Ps.
Ragi	...	...	1	3
Rice	...	...		6
Dholl	...	...		7 1/3
Vegetables	...	...		6
Oil	...	...		2 2/3
Tamarind	...	...		2/3
Salt	...	...		1/6
Curry powder	...	...		2
Onions	...	...		$\frac{1}{2}$
			3	4 1/3

The daily cost is therefore As. 3-4.1/3.

For a month of 30 days the cost will be Rs. 6-4-10. With this we may compare the Report of the Salaries Committee which suggests 3 annas 5 pies for food per day inclusive I think of fuel.

But there are other items of expenditure. There is house rent. Broadly speaking there are two ways of living for a labourer in Madras. He may have a hut in a parchery or hutting ground or he may rent a room as a sub-tenant in a brick and tile house. In the former case there are different methods pursued. Certain rickshaw-wallahs, for example, hire a rickshaw from an owner. He provides them with a rickshaw and a hut. For the former the rickshaw-wallah pays a rent of As. 5 and for the hut 9 pies per day

a ground rent for the hut of As. 12 per month and have to erect their own hut which may cost about Rs. 30. If for this he has to borrow, he will probably have to spend from As. 14 to Re. 1-8 in interest. To secure a hut in Madras to-day costs therefore from Rs. 1-8 to Rs. 2-4 per month. There are, of course, some who maintain that the hut is insanitary and unfit for human habitation, and that in the monsoon season it is always wet and nasty. There is something in the contention. On the other hand this alternative has to be compared with the other possibility, namely, renting a room usually dark as a sub-tenant in another house, for which at the lowest one must pay Rs. 3. The minimum one can put for rent is Rs. 1-8. I think it would be fairer to put the higher figure Rs. 3. It is true some pay less even than Re. 1. They huddle in stables; they crowd into a hut already inhabited by a family, perhaps relatives, perhaps not. In the dry weather, that is not perhaps so great a hardship. They can sleep outside. In the wet weather when they must all sleep in the same hut perhaps 7 ft. by 7 ft. well, it is bestial. The Municipality, I understand, prescribes 112 feet as the minimum superficial area for such a family as we have taken as our unit. I regard the space as altogether too small.

Next we deal with clothing. The minimum required for a man is a loin cloth and a head cloth for use by day and as a covering by night. These cost at present Re. 1-2 each and the man is said to require two pairs of these per year *i.e.*, Rs. 4-8 per year.

His wife also requires two cloths per year. These cloths are 7½ yards long. A plain white cloth can still be bought at Rs. 3-12 but obviously a woman who is herself working as a labourer can hardly use a white cloth, and a coloured one costs Rs. 5-2, *i.e.*, Rs. 10-4 per year. We are assuming a family of two children, two cloths (one for each) for these as As. 10 each cost Re. 1-4. Therefore Rs. 4-8 plus Rs. 10-4 plus Rs. 1-4 or Rs. 16 per year, *i.e.*, Re. 1-4 per month.

Fuel is not easy to estimate. But one gundu of firewood costs As. 8. To boil one measure of rice 1-6th of a gundu is the minimum required. We can put fuel therefore at less that 9 pies per day or Re. 1-6-6 per month.

For miscellaneous expenditure we must allow something. Is the labourer never to chew betel, never to go by train, never to visit the barber, never to find vegetables a little dearer than is estimated, never to find that there are 31 days in a month instead of the 30 days we have estimated, never to haver light in his house at night? Shall it be As. 12 per month? It cannot be less.

To sum up.—

		Rs.	a.	p.
Food for man	...	6	4	10
Food for wife (4/5ths as in 1917)	...	5	0	8
Food for 2 children	...	6	4	10
Rent (I would like Rs. 3)	...	1	8	0
Clothing	...	1	4	0
Fuel	...	1	6	6
Miscellaneous	...	0	12	0
Total	...	22	8	10

or Rs. 24-0-0.

I lean to Rs. 24 per month as being the minimum of subsistence for such a family. But the wife of the labourer is often an earning member of the family. She may do casual cooly labour. She may make and sell appams. She may be a grass-cutter or a sweeper or a tiffin carrier. His earnings are very various. In 1917 we restimated them at Rs. 4. I doubt if we should be justified in estimating higher than Rs. 4-8. I know grass-cutters who are only getting Rs. 3. There is a woman employed in my house or Rs. 3-8, a house being provided for her. I suggest we are justified in budgeting for the women's earnings inasmuch as there is no sufficient household labour to occupy he whole day and it is probably better for he to be employed provided the work is not to
[illegible]

subsistence for the family is Rs. 19-8 for the man, and Rs. 4-8 for his wife. I admit, however, that under ideal conditions the husband should earn sufficient for all and anything earned by the wife would be utilized for securing special comforts for the present or for old age.

There is another point on which I am not satisfied—the number of children for which we have reckoned. We have taken the average number as two. I believe in Madras it is larger though I have not been able to secure figures to justify my belief. This is a point on which we require further investigation.

Again be it remembered, there is practically no comfort and little opportunity for self-improvement in such a life as this amount of money provides. There is no opportunity for a holiday. There is nothing to spend on the education of the children. There is no provision for saving for old age. There is nothing for charity. There is nothing for sickness, marriages, funerals and births. How are the expenses of these things met? There is only one source—Diminish the quantity of food. As a man said to me—"Sometimes we cook and sometime we do not." If there is additional expenditure on any of these heads, food is diminished and you have ill-nourished bodies and uneconomic men. We know too that much of the labourer's income goes to the toddy shops. The result is the same lack of sufficient nourishment, and when an epidimic comes, down fall men and women and children like ninepins.

I am interested in this question as a practical living issue. But this is not the time and place to apply the moral. If these calculations are reliable, it means that we have no right to employ a married man unless we give him such a living wage as we have reached and we must endeavour to bring influence to bear upon all employers of labour to adopt the same principle and secure the same end.

THE ECONOMICS OF THE PEACE— A REVIEW.

By "P. C. S."

No book published since the end of the war has been more discussed than Mr. Keynes' book on "The Economic Consequences of the Peace" (*Macmillan*. 8s. 6d. net). We owe Mr. Keynes an apology for so belated a review of it but the delay is not altogether to his disadvantage. The events of the last few months have done so much to establish the justice of his main conclusions that we can assure our readers that the book is even more deserving of study now than when it issued at the beginning of this year.

Mr. Keynes commences by showing that before the war Germany was the cogwheel of the European economic machine. "Round Germany as a central support the rest of European economic system grouped itself and on the prosperity and enterprise of Germany, the prosperity of the rest of the Continent mainly depended". The war wrecked European economic machinery almost as completely as Germany did, in a literal sense, the machinery of industrial France and Belgium. The theme of Mr. Keynes' book stated very briefly and crudely, is that it cannot again work with anything like its former efficiency until the damaged cogwheel has been repaired. It was, of course, Germany's own action which caused the damage in the first instance but the action of the Peace Conference has only made matters worse. Mr. Keynes saw the working of the Conference from the inside for he was the official representative of the Treasury and also acted as Deputy for the Chancellor of the Exchequer on the Supreme Economic Council. Indeed, the impression one gets is that he was far too close to the chief actors in the drama which enfolded itself at Paris to be able to judge them fairly

Wilson had "not even much of that culture of the world which marks M. Clemenceau and Mr. Balfour as exquisitely cultivated gentlemen of their class and generation. More serious than this he was not only insensitive to his surroundings in the external sense, he was not sensitive to his environment at all. And "he did not seek to remedy these defects by seeking aid from the collective wisdom of his lieutenants." M. Clemenceau "was by far the most eminent member of the Council of Four and he had taken the measure of his colleagues. He alone had an idea and had considered it in all its consequences. His age, his charcter, his wit and his appearance joined to give him objectivity and a defined outline in an environment of confusion. One could not despise Clemenceau or dislike him, but only take a different view as to the nature of civilized man or indulge, at least, a different hope." Mr. Lloyed George is not so trenchantly dealt with and Mr. Keynes' views of him have to be inferred from such asides as the following. "To see the British Prime Minister watching the company, with six or seven senses not available to ordinary men, judging character, motive and subconscious impulse, perceiving what each was thinking and even what each was going to say next, and compounding with telepathic instinct, the argument best suited to the vanity, weakness or self interest of his immediate auditor, was to realize that the poor President would be playing blind man's buff in that party." There is no light and shade about this portraiture. It is impossible to believe that Mr. Clemenceau was as cynical, Mr. Lloyd George as diabolically clever in certain directions or President Wilson as much at the mercy of both of them as Mr. Keynes makes out. The truth is that not only was the hour too great for the men but it was too great for any man. Face to face with the consequences of a world catastrophe of appalling ... intellects were but that Mr. Keynes errs in attributing the defects in the Peace Treaty so exclusively to defects in the characters and temperaments of the men who made it.

From his dissection of the men. Mr. Keynes proceeds to the dissection of their work. His two main propositions are that the terms of the Treaty were not in accordance with the terms of the Armistice and that, in any case, the sums which it is proposed to demand from Germany are excessive and impossible to obtain. As regards the first of these, everything turns on the interpretation of the second of the two great qualifications, subject to which the Allied Governments declared their willingness to make peace with Germany on the terms laid down in President Wilson's address to Congress of January 8, 1918, and the principles of settlement enumerated in his subsequent addresses. The Allied Governments stated that they understood that "Compensation will be made by Germany for all damage done to the Civilian population of the Allies and their property by the aggression of Germany by land, by sea and from the air". Mr. Keynes' holds that these words are perfectly plain and are capable of only one interpretation. Their meaning cannot be stretched to cover the demand for the payment of pensions and separation allowances thus raising by £5,000 millions a claim which in Mr. Keynes' opinion amounts to not more than £3,000 millions. It is interesting to learn from a recent book by Mr. B. M. Baruch, one of the President Wilson's chief advisers on financial and economic questions at the Peace Conference, that it was a memorandum by General Smuts which finally removed the President's objections. General Smuts is a great man and a great statesman but, notwithstanding the weight which attaches to his opinion, we think that Mr. Keynes' is right. If his other conclusions are accepted, the question becomes for practical purposes one of academic interest, for the

within the Armistice terms represent more than she can ever hope to pay. His estimate of the compensation due from Germanay for what may legitimately be regarded as damage done "by land, by sea and from the air" is profoundly instructive. For Belgium he places the figure at £500 millions and as this is so much below what most of his readers must have expected, it is worth-while seeing how he arrives at it. He points out that Belgium is a small country and that the actual area devastated by the German hordes was only a small proportion of the whole. After the first onrush of the Germans, the battle line was practically stationary and hostilities were confined to a corner of the country much of which, in recent times, was backward, poor and sleepy and did not include the active industry of the country. The official survey of the wealth of Belgium published in 1913 by the Finance Ministry placed the total wealth of the country at £1,181 millions. A total of £1,500 millions would, in Mr. Keynes' opinion, be fairly liberal. The actual physical loss by destruction and loot he wood put at not more than one-tenth of this or £150 millions as a maximum. Claims in respect of levies, fines, requisitions and so on might amount to a further £100 millions. In view of the special position of Belgium in regard to reparation as admitted by the Germans themselves, the sums advanced to Belgium by her Allies for the general costs of the war, including the cost of relief, have to be added. These amount to about £ 250 millions and bring for France, Mr. Keynes' figure is £ 800 millions. £500 millions the total up to £ 500 millions of this are for physical and material damage to the occupied and devastated areas and £300 millions for other heads such as loans and requisitions on the occupied areas and losses of the French mercantile marine. Great Britains bill, on the same basis is £570 millions, mainly for losses of merchant shipping, and the total for all the conclusion is that a claim against Germany based on the interpretation of the pre Armistice engagements of the Allied Powers which he has adopted would assuredly be found to exceed £1,600 millions and to fall short of £3,000 millions. He, therefore, holds that the German Government should have been asked to agree to pay a sum of £ 2,000 milllions without further examination of particulars.

So much for the claim. What of Germany's ability to meet it either immediate or prospective? Nothing worth speaking of can be expected in the form of gold and silver, for any withdrawal of the precious metals would ruin the German currency system altogether. The maximum contribution from surrendered shipping and from saleable securities held by Germany abroad may be put at from £250 millions to £350 millions whilst £80 millions would be a liberal estimate for the value of property in ceded territory or surrendered under the Armistice. The sum total is thus £330 to £430 millions but Mr. Keynes is careful to point out that nothing like this sum is available for reparation as the first charge on it is the cost of the Armies of Occupation and the second the cost of necessary food and raw material which the Allies consider it essential that Germany should have. After making deductions for these charges, we are left with from £100 to £200 millions and as Belgium has secured first claim on this, the upshot of the whole matter is that Belgium may possibly get her £100 millions by May 1921, but that none of the other Allies are likely to secure anything at all.

The brings Mr. Keynes to the question of annual payments., He examines in detail the statistics of Germany's trade before the war and points out that for the five years ending with 1913, her imports exceeded her exports by £74 millions. In what commodity is she to pay. In coal and coke? The

that for the time being 20 million tons is the maximum possible export and, on this basis, there is no increase in value measured in pre-war prices. In woollen or cotton goods? An increase in pre-war values is impossible without the raw wool or cotton and having regard to other claims on supplies, a decrease is likely. Dyes? Their total value in 1913 was £10 millions. So on down the list. On the side of imports rather more is possible. By lowering the standard of life, an appreciable reduction of imported commodities might be effected. But many large items are incapable of reduction without reacting on the volume of exports. Mr. Keynes' final conclusion therefore is that, including all methods of payment—immediately transferable wealth, ceded property and an annual tribute,—£2,000 millions is a safe maximum figure of Germany's capacity to pay. In all the actual circumstances, he does not believe that she can pay as much. "Let those who consider this a very low figure bear in mind the following comparison. The wealth of France in 1871 was estimated at a little less than half that of Germany in 1913. Apart from changes in the value of money, an indemnity from Germany of £500 millions would, therefore, be about comparable to the sum paid by France in 1871, and as the real burden of an indemnity increases more than in proportion to its amount, the payment of £2,000 millions by Germany would have far severer consequences than the £200 millions paid by France in 1871."

We cannot but think that Mr. Keynes' criticisms of the provisions of the Peace Treaty regarding the surrender of shipping, the expropriation of German private property, the demands on Germany for coal and iron, and the transport and tariff systems should have followed his examination of Germany's capacity to pay instead of being made in an early Chapter of the book for their main [illegible] still further Ger-

The truth is that the Peace Treaty represents a compromise between two points of view. There were those who wished Germany crushed completely and there were those who recognized that if Germany were to contribute any sum worth having towards the cost of the war, it would be folly to deprive her entirely of the means wherewith to do so. The Treaty achieves neither the one aim or the other. Its vital defect, in Mr. Keynes' view, is that it includes no provision for the economic rehabilitation of Europe which, unless the terrible inflation of its currency system is speedily reduced, is heading towards another catastrophe. It is, at any rate, reassuring to find that Mr. Keynes does not see in England the slightest possibility of such a catastrophe or of any serious likelihood of a great upheaval of society. "The war has impoverished us but not seriously." A National Debt of nearly £8,000 millions seems serious enough in all conscience and we think Mr. Keynes, like other economists, attaches too much importance to the fact that the greater part of it has been borrowed at home. This, however, is by the way. What is to be done for the continent of Europe? The first thing is to escape from the atmosphere and methods of Paris. The Peace Treaty must be revised, and the demands on Germany must be limited to £2,000 millions. Of this the value of property already surrendered should be taken as £500 millions. The balance should be paid in thirty annual instalments commencing with 1923 and should not carry interest pending its repayment. The Allies' option on German coal should be abandoned except that Germany's obligation to make good France's loss of coal through the destruction of her mines should remain. A free Trade Union should be established under the auspices of the League of Nations of countries undertaking to impose no protectionist tariffs whatever against the produce of other members of the Union. Indebtedness be [illegible]

Associated countries should be wiped out. Mr. Keynes holds that this proposal would involve the United Kingdom in neither loss nor gain. The external debt of the United Kingdom, some £842 millions, is only owed to the United States whilst she is owed £1,740 millions mainly by France, Italy and Russia. The debt from Russia, £568 millions, may be written off and Mr. Keynes thinks that the loans from the United Kingdom to the Allies as a whole can be reckoned at not more than half their face value. On this hypothesis, the United Kingdom is owed £ 870 millions and owes £842 millions. It will be noticed that Mr. Keynes writes down one side but not the other and the proposal amounts to this that, as happened after the Napoleonic wars, it will be the United Kingdom, of all the European powers, that will have to pay the biggest bill for freeing Europe from the despotism of a tyrant. We have said " of all the European powers " for, Mr. Keynes' proposals were accepted, the United States would wipe out a debt of £1,900 millions. We hardly think that Mr. Keynes' views are likely to find favour in America. The financial sacrifices of the United States have undoubtedly been, in proportion to her wealth, immensely less than those of the United Kingdom but she is showing no inclination to make any more. Possibly she might agree to Mr. Keynes' next proposal and assist in raising an international loan for the benefit of distressed Europe. The telegraphic summaries of the report of the Brussels Conference which is in session at the time of writing mention that a system of international credits is being evolved so that Mr. Keynes' ideas on this point are being put into practice. Most disputable of all is his view that German enterprise and organization must be utilized to restore the productivity of Russia. German "enterprise and organization" are largely responsible for the present state of One would have thought, especially after Mr. Keynes' gloomy picture, that the task ahead of Germany, even if the indemnity is reduced to his figure, was sufficient to occupy all her energies for at least a generation. In any case, German penetration in Russia cannot be permitted until German good faith becomes more evident than it is at present. But with the main theme of Mr. Keynes' book we are in cordial agreement. Germany, drastic though her punishment deserves to be, cannot be left in the position of the Indian ryot who never knows how much he owes the sowcar. All he does know is that the debt goes on mounting up and that he will never be able to pay it. He is deprived of all incentive to reduce it and sinks into a state of hopeless apathy. As we write, we note that Mr. Lloyd George has expressed himself in favour of the fixation of the indemnity at a definite figure. That is all to the good but the figure must be a reasonable one.

The demand for electric lamps in Japan is rapidly increasing, and with the completion of the many new power plants under construction and projected, the home market may be expected to keep the factories busy. About 80 to 90 per cent of the output is manufactured by the Tokyo Electric Co.,—the Japanese branch of the General Electric Company—but other companies are forging ahead producing lamps of excellent quality using the tungsten filament, says the *Far Eastern Review*. The leading competitor is the Dai Nippon Electric Bulb Company. The Kobe Electric Lamp Company, the Tokyo Taguro Electric Lamp Manufacturing Co., the Lion Lamp Company, S. Kondo & Company, and the Nippon Chisso Lamp Company are also building up large businesses.

STORES PURCHASE COMMITTEES REPORT

[*The following is a summary of the conclusions and recommendations of the Stores Purchase Committee appointed by the Government of India:—Ed. M.E.J.*]

SCOPE OF ENQUIRY.

The following summary of our principal conclusions and recommendations is intended to provide a birds-eye view of the contents of the preceding report; we do not attempt here to review points of detail, or to recapitulate the reasons which have led up to the judgments formed, but refer the reader to the appropriate chapters and paragraphs.

The committee was appointed in view of the necessity of encouraging Indian industries while at the same time securing economy and efficiency, to enquire and report on the measures required to enable government departments to obtain their requirements as far as possible in India; to devise the necessary organization; to suggest the nature of its internal and external relation: and to indicate the modifications necessary in the stores purchase rules.

In the course of our enquiries, we have considered it necessary to make a comprehensive survey of the subject matter, and our investigations have, therefore, had reference to the general question of the supply of stores of all sorts for government departments, railways and *quasi*-public bodies; and have comprised a review of the conditions governing the purchase both of indigenous and of imported stores, as well as of ships.

Under peace conditions, imported stores forms a preponderating part of the purchases which we have reviewed. Under war conditions, the ratio between such stores and those of local origin was modified in favour of the latter, but imported stores still represented [illegible]

In suggesting the details of the proposed Indian stores department, we have decided that, in view of the great expense which would be involved without corresponding advantage, the establishment of central stock depots would be justified.

GOVERNMENTS' STORES PURCHASE POLICY.

A review of the stores purchase policy of the Government of India from the year 1862 onwards leads to two prominent conclusions:—

(*i*) that the Government of India have not been generally successful in the efforts made by them from time to time, to procure relaxations of the stores rules, in respect of the encouragement of local industries and of the local purchase of imported stores;

(*ii*) that this failure has been contributed to largely by the influence of the store department of, and the Consulting Engineers to, the India Office.

With the establishment of an efficient department in India for the purchase and inspection of stores the time has, we consider, now come when the Secretary of State should delegate to the Government of India full control over the details of the Stores Rules. Complete freedom should be granted to India in this matter; and it should be accepted as a policy, not only in theory but also in practice, that all stores required for the public service shall be obtained in India whenever they are procurable in the local market of suitable quality and reasonable price, preference being given to articles of Indian origin.

We anticipate that the work devolving upon the Director-General of Stores, India Office, will be reduced, and consider that his department should, in due course, be reconstituted as the London Branch of the Indian Stores Department, the status of the offic

in charge becoming that of a Director, immediately subordinate to the Director-General of Stores in India. As an interim measure, and pending the above development, we recommend the transfer of the existing organization of the Director-General of Stores, India office, from the immediate control of the Secretary of State to the charges of a High Commissioner for India.

A review of the existing methods of purchase in the several departments of the public service shows that local officials are at present, greatly handicapped for want of information regarding, and facilities for using existing Indian resources owing to the absence of any central authority possessed of comprehensive knowledge, and of an organization capable of not only placing orders but also seeing that they are properly met.

MORE FREEDOM OF CONTROL URGED.

A consideration of the existing practice of Government with regard to the maintenance of factories and departmental workshops indicates the necessity for the adoption of a more consistent policy of reliance, in ordinary cases, upon private enterprise, although we recognize that Government factories may properly be retained in some cases on grounds of convenience, and, in others, of expediency. We question the validity of the argument sometimes advanced as to the relative economy of Government factories; but even if this could be substantiated, we do not think that it should determine the decision of Government. Some of the existing factories could in pursuance of the above policy, be either reduced in scope or altogether abolished.

In view of the tenor of the Reforms Act, we consider that local Governments should, in future, be free to deal, as they wish, with purchases of stores, of indigenous origin or local manufacture, for their own requirements. Having regard, however, to the influence which the adoption of a sound imported srores are procured, may be expected to have upon the industrial development of India, we consider that the purchase of imported stores should continue to be controlled by the Government of India, so far as regards policy though not as regards the precise mechanism utilised. Local Governments should not be bound to utilise the agency of the Indian Stores Department, though they would be free to use it if they so desire; and we have provided special facilities to enable them to do so.

Companies, which work government railways are free agents as regards purchase of stores. Under their existing contracts, they could not be compelled to conform to the policy approved by Government, nor to utilise the Indian Stores Department, though it is hoped that they will generally do so. We suggest that, when new working contracts are framed, opportunity should be taken to require the railway companies to conform to the Government of India system and procedure. Indian Native States and *quasi*-public bodies, such as municipal ties, should be free to utilise the services of the new department subject to a reasonable payment.

PREFERENCE TO INDIGENOUS STORES.

As regards stores of Indian origin, the principal ground for complaint at present is, that the expressed policy of Government in favour of the purchase, by preference, of such stores, rather than of imported articles, is defeated by the prevailing lack of information amongst Government officers, of the available resources of the country by the difficulty they experience in making the close comparison of price now required, and by their defective equipment for making use even of such resources as are within their knowledge. The result is that officers are induced to adopt the line of least resistance, and to obtain stores of extraneous origin when, with better facilities, they might obtain instead suitable goods of Indian manufacture. This reacts prejudicially on

ıe economy and convenience of the public ervice.

The remedy is to be found in the estabishment of an expert purchasing agency in ndia, equipped with facilities for knowing he manufacturing resources throughout the :ountry; able to purchase efficiently in the various markets of India; and competent to carry out such inspection as may be necessary. The Indian Stores Department, the establishment of which is thus indicated, must have authority and facilities to ensure that orders shall, in accordance with the accepted policy of Government, be placed in India for goods of local production whenever possible, and that imported stores shall only be purchased when suitable Indian goods are not procurable.

We consider that, in addition to providing in this manner for the full utilisation of existing industries in India, Government must further give them practical encouragement, especially in the initial stages of their enterprise, and must assure them of a reasonable measure of protection against outside competition. The measures advocated by us, subject to appropriate restrictions and safeguards, are :—

(*i*) guarantee of orders for a limited period;
(*ii*) placing of orders at favourable rates for a limited period;
(*iii*) favourable railway rates,
(*iv*) revision of the fiscal policy of Government, with a view to the protection of local industries;
(*v*) adoption of a conventional rate of exchange in effecting comparisons between prices quoted for indigenous and imported goods of the same class.

We consider that the conditions under which contracts are placed in India should be assimilated to those attaching to contracts entered into by the Director-General of some respects more favourable to the British manufacturer.

DEVELOPMENT OF INDIAN INDUSTRIES.

The purchase of such stores as are not, procurable of local manufacture is, at present regulated artificially by rules, the effect of which is practically to prevent, in ordinary cases, such stores being purchased in India from dealers or other. We agree that the time has come when such artificial restrictions should be abolished, and that it should be open to officers responsible for the purchase of imported stores to take advantage of the cheapest available market in which suitable articles can be obtained, having due regard to the convenience of rapid supply and other special advantages. The several channels through which these stores might be purchased should thus be free to compete with each other on their merits. We anticipate that, in practice, it will be found advantageous to procure certain classes of imported stores considerably more freely than hitherto through the agency of branches, agents and dealers in India. The demands placed on London will thus be reduced in two distinct ways :—

(*i*) by the interception demands for imported stores for which articles of Indian manufacture can be submitted, and
(*ii*) by the increasing purchase of imported stores in India instead of the United Kingdom.

Efficient arrangements for inspection are of great importance; it is on the distinct understanding that all stores purchased will be subject to examination, either during manufacture or before acceptance, that our main recommendations are based. In view of the intention that the Indian Stores Department should be as an instrument for the development of Indian industries, its inspection staff will be responsible, not merely for the detection of faults but also for indicatings ... the steps necessary to improve

the standard of their manufactures, and for the introduction of standardization of all articles in general use.

DETAILS OF PROPOSED ORGANIZATION.

We recommend the institution of inspection depots at suitable centres to facilitate the examination of certain classes of goods. At each depot a pattern room should be maintained.

A portion of the existing ordnance inspection staff should ultimately be absorbed and because of the conditions attaching to the use of military stores, certain military officers should be deputed from the Army for employment as liaison officers with the Indian Stores Department. The Inspection branch of the department should absorb the existing staff of the Metallurgical Inspector, Jamshedpur; and the inspection and Test House staff at Alipur. A test house should also be established in Bombay.

For the encouraging of shipbuilding, we recommend the liberalisation of the existing rules governing the supply of ships for the public service, with a view of utilising the capacity of Indian shipyards, and of promoting their development.

Having regard to the relaxation which will be desirable with the alteration in conditions in India in future, and to the complicated nature of the existing rules governing the purchase of stores for the public service, we have recast the rules with special attention to the provision of a clear enunciation of the policy of Government; to making effective the intention of giving all reasonable preference to the products of Indian industry: to the substitution, for existing arbitrary restrictions, of a more business like latitude in regard to the channel of supply of goods of foreign origin; and, to the exercise of judgment in the comparison of competitive tenders.

We have set out the details of the oraganiform, and have indicated the range and nature of the duties of the staff to be employed in the several sections on both the purchase and inspection sides. The organization set forth provides for a head-quarters staff, divided into purchase and intelligence and inspection branches and a general office, assisted by provincial agents and inspectors at the chief centres of industry. The provincial agents will provide special facilities for meeting the wishes of local Governments in regard to supply of stores, and will act as intelligence agents of the Indian Stores Department in close collaboration with the provincial Directors of Industries. We have laid down the extent to which the use of Indian Stores Department should be compulsory, and that to which it should be optional for the several departments of Government and others concerned.

For the convenience of the various authorities interested, we have set forth in some detail the procedure, which we contemplate should be adopted, both by the department's which utilize the Indian Stores Department, and by the department itself in dealing with the demands preferred upon it.

RECRUITMENT FOR SERVICE.

In the important matter of recruitment we have indicated the qualifications to be looked for in the several members of the staff whose employment we think necessary, and the sources from which they should be obtained. While indicating that, at the commencement, expediency must be the principal guide in selecting officials of suitable experience to fill the various posts, we make it clear that, once the department is fairly established, it will generally be advisable, at least on the administrative side, te engage only junior men in each branch, and to fill vacancies by promotion. We recommend that, whenever suitably qualified men can be obtained in India to fill vacancies, preference shall be given to statutory natives of India.

specially dealt with, and, in this connection, we have drawn attention to the advantage to be expected from the transfer of some of the experienced establishment of the India Office Store Department to fill some of the new appointments in India.

THE FINANCIAL SIDE.

We contemplate close association between the officer of the Finance Department in charge of the Acconnts Section and the head-quarters officers, and branches of the Indian Stores Department; and we lay stress upon the importance of their connection, with a view to the prevention of delays in payments of bills for stores supplied, and to the avoidance of friction. We contemplate that bills shall be paid from head-quarters, and that debits shall be transmitted by the Accounts Section to the departments concerned. Particular attention is invited to the necessity for the observance of ordinary commercial practice in respect of the prompt settlement of accounts.

The details set out by us show that the additional net annual cost of the Indian Stores Department may be estimated at Rs. 14,60,000, a figure which, though considerable in itself, is relatively small, and represents only about two per cent of the value of the stores which we anticipate will be handled each year. The estimates, particularly of the volume of stores to be dealt with, are unavoidably speculative; but even if the ratio of the cost of the department to the value of stores handled should prove to be appreciably higher than we anticipate, it is still very unlikely that it will reach an unreasonable figure.

COTTON SPINNING MILLS.

By "X"

THE cotton spinning industry in India is comparatively speaking only in its infancy, but in recent years, it has made such rapid strides that it has a future before it, perhaps only second to the vast cotton industry of Great Britain. In fact the Lancashire Mill-owners have already recognized with some apprehension the growing importance of cotton trade in India and even as far back as 1886, Mr. Thomas Ellison, an eminent Liverpool cotton broker, has recorded in his valuable treatise on the cotton trade of Great Britain that England's most formidable rival and competitor in the cotton trade is India.

The above conclnsion can be proved by an examination of the relative positions of India and England with respect to (1) cost of raw material, (2) cost of mills and machinery, (3) cost of power, (4) cost of labour, and (5) cost of reaching the consumer, all of which go to make up the cost incident to the spinning of cotton.

(1) India has a distinct advantage over England with regard to the cost of raw material. India has a bountiful supply of raw cotton for the spinning of coarse counts Even with regard to material for mediun and fine spinnings it may be possible t cultivate them to a large extent by an appli cation of scientific and technical skill i cultivation.

(2) Although England has the advant age over India with regard to the cost mills and machinery, yet this advantage more apparent than real, being fully counte balanced by the number of working hou in India being much greater than in Engla and thus considerably reducing the char every pound weight of yarn spun, represent under the head of rent, depreciation a

(3) With regard to the cost of labour, India enjoys a great advantage over England. It is true that the latter possesses skilled labour, the like of which it is impossible to recruit in Indian mills. But the wonderful automatic cotton spinning machinery of to-day supplies the intelligence—the advantage possessed by the skilled labourer over his unskilled brethren and only requires the workman "to follow up" by devoting his attention to the simple details of the working.

(4) Coming to the cost of power, India is under a decided disadvantage as compared with England which has an unfailing supply of coal. The development of Indian coal-fields and the use of petroleum as fuel may likely turn this disadvantage into an advantage.

(5) Being in the very centre of Asiatic countries which are the largest consumers of cotton cloth in the world India enjoys an advantage with regard to the cost of reaching the consumer which it would be very hard for England to compete with successfully.

It is evident from the foregoing that there is a bright future before the cotton spinning industry in India and that this industry offers a wide and rich field for capital and enterprise which it is hoped would be availed of with success by the enterprising capitalist of this country.

The erection of a spinning mill is however an expensive undertaking and the following points in connection with such an undertaking should have to be carefully considered before any action is taken thereon.

(*a*) The first and foremost consideration which ultimately has direct bearing on the successful working of a spinning mill is with regard to the provision of ample funds for the erection of a substantial building on the latest and most approved plan, equipment of the best and the most perfect types of machinery and for maintaining a surplus for working expenses. The starting of a 10,000 spindles would likely require a working capital of at least 15 lakhs of rupees.

(*b*) *Location of Site.*—If the necessary amount of capital required for a spinning mill is forthcoming, the next question to be decided is the location of the mill. Cotton spins best in an atmosphere naturally warm and humid and it is most desirable, other circumstances permitting, to locate the mill where nature has supplied this all important aid to good spinning. Where nature has not been bountiful in this respect, this deficiency has been supplied by the use of mechanically worked humidifiers working in various systems. Of these the Vortex system, has obtained a high reputation in India. This machinery is obtainable from Messrs. Mather and Platt, Ltd., Manchester.

Other important points to remember in deciding upon the choice of the site are—(1) It would be advisable to start the mill in or near a cotton spinning centre so as to facilitate the recruiting of trained and experienced hands in mill work. (2) The question of facility of transport should also be considered when deciding upon location since the cost of transport is one of the larger items of expense. (3) The proximity to an abundant and never failing supply of good soft water for feeding the boiler and for dyeing and bleaching purposes should also be kept in view. (4) Cost of fuel and the building material and the facility for their transport also play a prominent part in determining the site for the location of a spinning mill.

(*c*) *Building.*—The building for a mill must be well constructed, and the materials used in the construction should be very good. The floor space that may be required for installing spinning machinery with 10,000 spindles would approximately be about 50,000 sq. ft. To this must be included space for officers quarters, hospital for the workmen, technical school, recreation ground, etc. A ground covering an area of 2 acres

erecting buildings of all kinds required for a mill with 10,000 spindles.

The mill may be constructed in the form of either a storied building or a shed. The majority of the mills are however of the latter type which follows the Saw Tooth principle, the light facing the north, glass roofs running east to west, the glass at an angle of 30 degrees to the vertical height of roof 20 ft., height of the gutters from the floor 15 ft. and the height of the line shaft 12 feet. The cost of the building and site would vary according to local conditions but may be put down at 3 to 4 lakhs of rupees.

(*d*) *Method of Driving.*—Transmission of power to all the machinery is effected by steam engines and Lancashire boilers. Messrs. Musgrave, Ltd. of Bolton deal with high class of machinery required for driving.

(*e*) *Machinery.*—The following machinery would be required for a spinning mill with 10,000 spindles.

1. Hopper Bale Breaker.
2. Improved Thread Extractor.
3. Roving Waste Opener.
4. Hopper Feeder combined with
   Porcupine Beater
   Dust Trunks
   Crighton Opener
   Exhaust
   Breaker Scutcher.

5. Intermediate Scutchers	... 2.	
6. Finisher Scutchers	... 2.	
7. Cards	... 40.	
8. Drawing Frames	... 5 sets.	
9. Slubbing ,,	... 5	(92 spindles each)
10. Intermediate ,,	... 9	(126 ,, ,,)
11. Roving ,,	... 16	(160 ,, ,,)
12. Ring ,,	... 32	(320 ,, ,,)
13. Reels	... 8	
14. Pirn Winding Machines.	7	20 ,, ,,

They could be had from:—

1. Howard and Bullough, Ltd., Accrington, England.
   Agents:—Messrs. Greaves Cotton & Co., Forbes Street, Bombay.

(2) Wilson & Longbottom, Bransby, England.

(3) Asa Lees & Co., Soho Iron Works, Oldham.

(4) John Hetherington & Sons, Ltd., Manchester.
   Agents:—Messrs. Felber Jucker & Co., Ltd. Bombay and Manchester.

(5) Dobson & Barlow, Ltd., Bolton.
   Agents:—Messrs. H. M. Mehta & Co., 123, Esplanade Road, Bombay.

(6) Hacking & Co., Ltd., Bury, Lancashire.
   Agents:—Messrs. H. M. Mehta & Co., 123, Esplanade Road, Bombay.

(7) Henry Livesey Ltd., Blackburn, England.

(8) Brooks & Doxey Ltd., Manchester.
   Agents:—Messrs. Sorabjee Shapurjee & Co., 303, Hornby Road, Fort, Bombay.

At present all the manufacturing firms are booked with orders for 4 years to come and regret their inability even to quote prices. They are, however, prepared to take in any order which may be placed with them now and supply the machinery after the execution of all orders on hand at the prices ruling at the time of delivery. The totol cost of all machinery required for a spinning mill with 10,000 spindles would approximately be about six lakhs.

Variety of cotton to be spun into yarn.—One of the most important questions which will have to be solved before a spinning mill is started is with regard to the varieties of cotton to be spun into yarn and the number of counts up to which the mill wishes to spun yarn. The market for which the yarn is intended has also to be considered.

At present yarn spun by power machinery in India is mostly of counts below 30s. and although some mills spin to a very limited extent finer counts of yarn from 30 to 60s and even to 80s. from the American an[d] Egyptian cotton, yet the bulk of yar[n] manufactured is from Indian cotton and i[s] usually of 4s. to 20s; the lower counts u[p] to 22s. are produced in greater quantiti[es] than the finer counts.

The spinning mills in India are mo[re] favourably placed with regard to the fi[ve] elements detailed in paragraph 2, than t[he] spinning mills in the United Kingdom b[ut] yet their success is more limited than that

aim, method and principles of work followed by these mills.

The British spinning mills spin yarns from cotton imported from America, Egypt and India. They aim primarily at supplying the exact requirements of the local consumers—the weaving mills of England—and any excess *left after meeting the local demand is* exported for consumption in foreign countries. Each spinning mill specialises in a certain range of counts, put down their plants of machinery accordingly and try to spin those particular ranges of counts in an uniform if not ever improving quality and endeavour to turn out the maximum quantity in as short a period as possible and thus reduce their cost of production to a minimum. This they do by using a better grade of cotton than what may be actually necessary for their requirements and thereby eliminate unnecessary waste in production and also ensure steady and continuous work done with ease by their employees. The energy of these people thus preserved is utilised in making them attend to the maximum number of machines. This arrangement is no doubt costly as the employees have to be paid better wages but it aims at the maximum production per head aud thereby reduces the cost of production to a minimum.

The yarn spun by these mills are subjected to most exacting and critical tests and if any further improvements are required by the purchasers, the mills are prepared for making them provided the purchasers offer them higher rates.

In short the English spinning mills aim at spinning yarns which can find a large and profitable sale in the best markets of the world.

The Indian spinning mills are on the contrary, confining their activities to the spinning of the same range of counts throughout the country. They do not specialise in any

which its yarn is sold, yet none of them can boast of having any particular standard of quality they are trying to maintain. This defect is due to the mills selecting cotton for their requirements more with a view to being able to produce yarns for being sold at a competitive price in the market than with a *view to maintaining an uniform and particu*lar standard of quality. It is, therefore, natural that these mills utilise a larger number of employees, make more waste in their process of manufacture, have irregular quality and quantity of production and incur greater productive costs than the English spinning mills.

One of the grave mistakes committed by the Indian spinners is that they would sooner spin yarns for sale to China and other places than cater to the requirements of the local purchasers in India. Yarns exported to China have to travel a long distance and take a good deal of time before they reach the hands of the weavers and so, any defect in the quality, counts and reeling of the yarn is seldom if ever traced back to the men at fault. Thus, the spinners are the lords of the situation and do not, therefore, care to make any attempt at improving the quality of yarn spun by them. The advent of Japan in the China market has, however, opened the eyes of the Indian spinners and some of them have already recognized the necessity for catering to the requirements of the weaving industry in India. This should be the aim of every cotton spinner in India and those that contemplate the starting of a spinning mill should fully bear this in mind.

(*g*) There is still another important consideration which does not seem to have been fully recognized by many of the mill-owners in India, and this is with regard to the selection of capable men to manage the mills. In every undertaking, good management is indispensable to success and in such expensive concerns as cotton spinning mills, which

the proprietors should be very careful in the chöice of those to whom they confide the management of their mills. Much attention has not been paid to this most important item in the successful working of a spinning mill and it has been observed by many that there is a very great room for improvement in the management and general conduct of the business in a large number of Indian mills.

The unsatisfactory state of affairs at these mills may be traced to two causes—first to having non-practical men as managers and second to the bad and vicious system of paying the agent commission on the out turn irrespective of profit or loss. To remedy these defects, the best course would be to appoint a practical man with varied mill experience as Manager. Even if the best men are not available in the country it would be advisable to get men from England. They would, no doubt, be costly but the wages would bear an insignificant proportion to the profits which they would be able to show.

It will be self-evident from the above that the following conditions enunciated by Richard Marsden, a great authority on the subject, are absolutely necessary for the successful working of a cotton spinning mill :—

"The locality must be well chosen; the site of the mill carefully selected; the mill well constructed; the machinery must be of the best for its particular purpose; and the management must be skilful, economical and thoroughly honest. Technical, scientific and commercial knowledge combined with steady industry and prudent enterprise are required to ensure success."

To such of these that desire to start spinning mills but are not in a position to completely satisfy the above conditions, the best advice that can be given is "*don't*"

ELEVATING THE PANCHAMA.

By K. S. Chandrasekhara Aiyar,
B.A., B.L.,
Judge, Chief Court of Mysore.

[In opening the Mysore Panchama Conference held last month at Mysore, Mr. K. S. Chandrasekhara Aiyar made a suggestive speech. In view of the importance of the question we publish the text of the speech below.—Ed., M. E. J.]

We have met here in conference to-day to discuss measures for the elevation of the classes generically known as 'Depressed,' who number, I may remind you, some 921,000 souls or nearly a sixth of the entire population of Mysore. It is a pleasure to see, amongst those present to take part in the proceedings, so many representatives of these classes, and also a large number belonging to other classes, including even some Brahmana ladies, who are all keenly interested in the work of uplift. That is indeed a hopeful sign, for the task in which we are engaged is a sacred task to which all children of the Motherland, high or low, ought to be drawn by reason of their common brotherhood.

It is hardly necessary for me to enlarg upon the present position of the classes out side the pale of the caste system. It is per haps slightly better in Mysore than in othe parts of India, particularly Malabar; bu taking it all in all, no impartial observer ca pronounce it to be other than deplorabl Look at the utterly insanitary *keris* or han lets in which they live, the ill-kept evi smelling huts in which they are packed t gether, the foulness of their food and drin their uncleanly clothes and unwashed pe sons, and all the other uncouth habits a ways of living which have contributed their being regarded as untouchable by t higher classes and at the same time have

disease. Consider the harsh and rough treatment, the cruel and harassing restriction, to which they are subjected, of which the want of access to pure sources of drinking water and the wicked Malabar custom of distance-pollution are probably the worst. Note the abject state of poverty, often made worse by chronic indebtedness, in which the majority are sunk and which have made them helpless and improvident to a degree, as well as degrading and often disgusting nature of the tasks usually assigned to them. Contemplate the low morality, the hopeless illiteracy, the very imperfect sense of self-respect and self-control, the petty jealousies and quarrels, the sectional divisions and disunions, and not least of all, the utter lack of ambition to rise, of the desire to improve. If you put all this together, you have a picture of a mode of life which it would scarce be exaggeration to say is not far removed from that of the domestic animals. In one word, it is a condition of arrested development, mentally and morally, and of utter physical debasement.

The facts are there for all the world to see, and we cannot wipe them out by simply shutting our eyes to their existence. They form in truth a serious blot on our ancient civilisation, a veritable canker which is slowly retarding the healthy growth of the national life and will arrest it completely if not extirpated in time. But neither need we make matters worse by losing our mental balance in passionate talk about friends and enemies in the national household, in wailings about cruelty, hatred and despair. The task is one which calls for sober consideration and combined action, and that as a matter not of charity but of justice, of genuine patriotism, and in the best interests of the country and nation as a whole. To say that in elevating the depressed classes we are but elevating ourselves is to repeat a very obvious truism.

The primal source of the degradation of the Panchama (some prefer to call them Adi Dravidas) must be sought in those ancient days when the original inhabitants of the country, the first owners of the soil, were overpowered by the Aryan invaders from the north and their following of mixed blood. The process af subjugation involved a virtual enslavement; that and the continuous and rigorous suppression practised through the succeeding ages have combined to form a class of miserable beings, which has been described as being to all intents and purposes slave population, living generation after generation uncared for, unregarded and despised.

More continuously operative than the original cause of their fall in keeping down this immense population must be admitted to be the harsh and oppressive attitude of the classes within the pale of caste towards the classes outside the pale; and this form of senseless bigotry is by no means confined to the highest or to any one caste. We need not blame the higher classes too harshly for their attitude; for they are, after all, to a large extent the creatures of their own environment, the products of a rigid system of caste, customs, and traditions. There is much truth, I think, in the explanation that not cruelty but indifference and thoughtlessness lie at the root of all these social evils. What else can you expect of people who obstinately follow customs because they are ancient even when they are decidedly injurious; who waste their substance in extravagant feasts and excessive mournings, coop up their women behind the purdah and deny their souls other scope for growth than in the performance of domestic drudgery; who rejoice in infant marriages and immature parentage for their sons and daughters, and are content to pay and to receive heavy prices for their brides and bridegrooms; who can look on without horror and an effective desire for change at the living martyrdom of virgin widowhood for the girls of their own flesh and blood?

But let that pass. We are living in times when the better sense of the nation is aroused and is beginning to arrest itself, when it is

being more and more felt that those who are hopelessly backward in the scale of progress are entitled by that very fact and of their common humanity to special consideration at the hands of those more advanced. As a matter of fact, some of the most zealous, active and single-minded advocates and workers for the cause of Panchama uplift are to be found to-day amongst the highest castes and the most aristocratic families, in the tenderest womanly hearts and the most cultured masculine intellects.

Governments and official bodies, too, have it within their power, and are as a rule disposed, to put down anything that savours of injustice and oppression, to insist that, in matters of secular concern, there shall be no privileges, partialities or disabilities based on considerations of caste, class or creed or the absence of such; that decent living, decided fitness and blameless character shall be the sole grounds for differential treatment where that is justified. It must be a source, by the way, of profound gratification to all of us that an eligible person has been found within the Panchama community to represent it on the District Board of Bangalore and on the Representative Assembly. The time has, indeed, come when, so far as the depressed-classes are concerned, it will no longer be right or even possible to deny them the opportunities and facilities for advancement that are open to all other sections of the people. A good deal of popular prejudice still remains to be overcome. How far that should be taken account of in any given case is a matter for the practical administrator which does not touch the question of principle. Meantime, public opinion at large must be educated out of its ancient habits of thought by means of conferences like this, by lectures, literature and, above all, by the living example of men and women who have given themselves up to the service of their depressed brethren. It is a slow and difficult task but all the same a necessary part of the remedial

It is not altogether easy to devise a perfectly satisfactory scheme of Panchama elevation, at once comprehensive, practical and economical. Ideal policies may be distilled out of the pure reason, but only the admixture of knowledge and sympathy can make them workable; the best is that which is adapted to existing conditions and adjusts itself easily to growing requirements. Most persons who have devoted thought to the subject seem to be agreed about the main lines on which the direct work of amelioration must proceed for the present, though they may differ in their views as to the details and the relative importance and urgency of the various measures. Speaking very generally, there is no question that, first of all, the general level of intelligence among the bulk of the depressed classes must be raised; and this by means of elementary education of a suitable kind, for all except the very old, to be enforced if necessary by compulsion and supplemented by the offer of free meals to the very poor, and by means of higher education, in residential institutions if possible, to promosing young men, who should be helped at the same time with liberal grants of scholarships. Moral and religious instruction should be given in school and outside, decent habits of living should be taught and higher ideals of conduct inculcated, including truthfulness, temperance, self-reliance and the civic virtues generally. Healthy dwellings in clean surroundings should be provided, as well as adequate supplies of water fit for drinking and washing. The economic condition, too, of the community, as a whole must be actively bettered, by such measures as the formation of the model settlements the grant of arable lands to Panchamas fo cultivation on tenures conditioned agains encumbrance and alienation, advances by th State for purchase of seed, implements, catt and other productive purposes, on easy term as to interest and repayment, special faciliti for the formation of co-operative societi with a view to promote thrift, to provi

credit and to affored help in the purchase and disposal of goods, as well as to furnish a general incentive to rise above poverty and wretchedness. And then, without impairing the acquired efficiency of the community as respects their hereditary occupations, technical and industrial training should be imparted to a certain number of young men with real aptitude therefor. Suitable openings should be found as far as possible for qualified candidates partly in trade and business, and partly in the lower or higher ranks of the public service. Lastly, private agencies working in the field should be encouraged and even liberally aided with funds and facilities for developing their activities as long as they work satisfactorily and on lines approved by the Government as well as acceptable to the communities concerned.

The elaboration of these various methods of betterment is a task for experts, and I do not pretend to be one. The most important method is education of the right sort, not too literary, not ignoring the moral nature, and calculated above all to instil self-respect and an aspiration to rise above the past. I believe it is now recognized that, in designing the courses of general and technical education for the depressed, special attention must be paid to increasing the capacity to earn a decent livelihood and to the real improvement of personal efficiency. It has been pointed out that hard labour put forth by a man in his younger days to master a skilled craft or trade will be worth more to him in after life than an incomplete course of higher education. The depressed classes, from what I have seen of them, seem to have a special aptitude for industrial work; and it will be a distinct piece of disservice to them and to the country at large if the education that is given to their boys weans them away from the hereditary occupations for which they have an aptitude, without at the same time properly qualifying them for modern technical pursuits or the intellectual professions, if it tends to swell the ranks of discontented young men who cannot compete on equal terms with the educated youth of other classes.

The compulsory admission of Panchama children into public schools is a controversial topic, which has excited a considerable amount of feeling. Our Government having already laid down a policy in the matter, it is not open to me to discuss it in this address. I may perhaps say, speaking quite generally, that, provided there is no marked disparity between the ways and manners of one class of pupils and the rest, there seems no good reason on principle why public schools maintained or supported from public funds should not be free to pupils of all classes alike. In a recent Madras communique it is pointed out that, when the Panchama has come under better influence and received some education, the difference in his cleanliness, self-respect and capacity for higher things is remarkable. And I have myself seen a number of Panchama youths who in person, refinement and manners are in no way inferior to many young men of the superior classes.

At the same time the value of special institutions in which Panchama children can be trained and taught in the earlier stages cannot be denied. And, as a matter of fact, much useful work in this direction has been done so far in the Mysore State. Nearly 700 schools for the depressed classes have been opened at various places, of which about 300 are departmental and the rest mostly aided institutions. A Central Panchama Institute, which I had the pleasure of visiting a few days ago, has been established at the capital of the State, and is being efficiently managed by a committee of non-official gentlemen, with an intelligent Panchama graduate as Superintendent; it has accommodation for nearly 200 boarders, who are taught various useful industries such as carpentry, weaving, tailoring and shoe-making, besides gardening which is compulsory for all. Boarding schools have also been opened at Tumkur and Chikmagalur. The education of girls is still in its incipient stage; but when it

does take root, it is bound to influence materially the progress of the communities concerned. Students of the depressed classes have been wholly exempted from payment of fees, and in addition scholarships are freely granted to young men studying English. It is gratifying to note that the facilities offered are being readily availed of, and that the grant of scholarships in particular has alredy done something, and is expected to do much more, to encourage the spread of education among the depressed classes.

A very active auxiliary in this field is the Mission for the Elevation of the Depressed classes under Royal patronage and presided over by our worthy and respected citizen, Mr. V. N. Narasimhiengar. It maintains eight schools for boys in the Mysore City, with as many as 500 pupils on their rolls, and three schools for girls with about 200 pupils; in addition it has started two Industrial Schools for boys and two for girls, in which weaving, sericulture, carpentary, needle-work and sock-making are taught. It also appears to be doing much useful work in the promotion of temperance, the settlement of disputes by arbitration, the formation of co-operative societies, the maintenance of reading rooms, the teaching of hygiene and sanitation, instruction by means of lectures and bhajanas, and other directions. This Mission affords valuable illustration of the kind of work not always to be compassed by official agency, which may be accomplished by private bodies with adequate encouragement and financial help.

Excessive drunkenness is the curse of the depressed classes. Some people hold that it may cease to be that a hundred years hence, when the craving for drink comes to be dealt with wholly as a moral and social problem without reference to the fiscal aspect. However that may be, it is perhaps possible even now to minimise its ravages, as for instance by the substitution of weaker and less unwholesome for the stronger and deleterious liquors. For men who have toiled and sweated the live-long day it must indeed be difficult to resist the temptation of the liquor-shop just beyond the corner; it is essential therefore that they should have within reach alternative forms of innocent recreation to occupy their evening leisure, such as dramas, Bhajanas and Harikathas. Night schools, too, are serviceable in this respect over and above the recommendation that they do not trench upon the wage-earning hours.

There is one other matter, of a more general character, on which I have to make a few observations; and that is with reference to the future conduct of the work of uplift. That is not, as I have already observed, a mere work of philanthropy, but one nearly touching the public interest and welfare, and requiring the close co-operation of official bodies and private agencies and individuals; its complete accomplishment will take much time, require steady effort, and entail a great deal of expense; and above all, as we have seen, it has to be carried on simultaneously on several different lines of activity. It is in these circumstances a question whether these activities may not be effectively co-ordinated, whether the forces engaged may not be concentrated in some permanent form of organization. In Madras the responsibility of looking after the interests of the depressed classes and of carrying out all schemes for their amelioration has been entrusted to a full-time Commissioner of Labour assisted by an Advisory Board. In Mysore I understand that a proposal for establishing a Depressed Classes Advancement Trust has been made by the present head of the Education Department, Mr. C. R. Reddy, who as we all know, is an officer full of enthusiasm for everything that touches the well-being of the backward and depressed classes. That proposal is before Government and therefore *sub-judice*.

But so far as this Panchama Confereuce is concerned, the idea occurs to me whether the opportunity of its existence may not be better utilised. The Conference, I take it, i

an annual function held under the auspices of the Mysore Civic and Social Progress Association. It is not a permanent body with a corporative existence; and beyond the fact that it is attended by representatives of the depressed classes who are deputed from the various taluks after some sort of rough and ready method of selection, it cannot be said to have a *definite constitution*. Speeches are made, papers are read, and resolutions are passed at each year's session. But I have not been able to gather that any continuous practical work is done in the name and on behalf of the Conference in the interval between one annual session and another, or in fact, that there is, if any, a recognized agency in existence charged with the task of carrying those resolutions into effect. This is possibly all that may have been feasible in the earlier years. But it seems worth while to consider whether the time has not come when the Panchama Conference may be placed on a permanent footing, whether, in order to utilise its labours to the best advantage and to ensure the turning out of better and more continuous practical work within the scope of its objects, it may not be formed into an independent organization--something on the lines of the Mysore Economic Conference or the Malnad Improvement Trust, but devoted specially to the cause of the uplift of the depressed classes, with branches in the various taluks and other important centres of the State. What is probably required above all else is strong and capable Executive or Standing Committee to work out the resolutions of the general body and attend to other business pertaining to Panchama welfare throughout the year. All this, including the constitution of the General body and the composition and function of the committee, is of course a matter for you to decide upon, should it commend itself to your consideration.

I think I have said nearly all that I wished to say on this occasion. I regard it as indeed a privilege to have been called upon to preside over this Conference; more even than a privilege, I feel it to be the call of duty, which over-rides many an excuse for inaction that might otherwise leap to the mouth. I am afraid I cannot put forward the claim which was very appropriately made by the gentleman who presided last year, to be a member of the community that is in conference; that is a drawback which can scarcely be helped in my case. I cannot use the language of authority proper only to the active worker in the cause, not that of picturesque exaggeration permissible to the partisan; and, besides, an officer of Government cannot always utter his thoughts aloud. But I yield to none in genuine sympathy for my Panchama brethren, and in the earnest wish to see their condition materially improved; and I can honestly say that I desire nothing better than to see the depressed classes lifted up from the degradation of ages and provided in ever-increasing measure with the opportunities and advantages of civilisation and culture. To the forces making for that consummation, I should like to add my little mite of encouragement and hearty good wishes; and whatever be the value or use of anything I have said, I know you will take the will to serve for the deed of service.

The latest "Forest Bulletin" contains a note on pyinma, ajhar, or jarul wood (*Lagerstrœmia Flos Reginœ, Retz*) by Mr. R. S. Pearson, I.F.S., F.L.S., Economist at the Forest Research Institute, Dehra Dun. The timber is found throughout Assam, Eastern Bengal and Chittagong, Burma, the South Konkan, North and South Canara, Malabar. In Assam it is in great favour for boat building, dugouts and railway sleepers; and is also used for house posts, interior wood work, for bridges and to a limited extent for furniture and spokes for carts. In Bengal it is much used for constructional purposes and bridge-building.

SUGAR PRODUCTION IN INDIA.*

Enquiries were recently undertaken by the Department of Statistics, India, regarding the sugar-producing capacity of the sugar factories in India on the lines of those made in 1918. Of the ninety factories to which schedules were sent, returns from forty only were received. Of the remaining fifty, twenty-eight did not furnish returns, ten were either closed or not in working order, six were engaged in the production of raw sugar, sugar-candy, etc., four did not manufacture or refine sugar, one did not start business, and one sold sugar-producing appliances only. *Of the forty returns received, one was defective* and another was not taken into account as the factory produced molasses only. The results of the census show that the thirty-eight factories, employing on an average 9,700 persons daily, produce, per day of about twenty-two hours, sugar amounting to 14,000 maunds of 82·3 lbs. each namely, 5,200 maunds from cane (first sugars), 2,100 maunds from cane (second sugars), and 6,700 maunds from raw sugar, and molasses amounting to 7,300 maunds namely 3,800 maunds from cane and 3,500 maunds from raw sugar. The *maximum amount of sugar* that can be produced by these factories is, according to the returns furnished, 16,800 maunds (or 617 tons) per day. The following statement shows the particulars furnished for the factories in each province:—

*Communique iss... artment of Statistics in India.

Province	Number of factories	Sugar produced from		
		Cane—first sugars	Cane—second sugars	Raw sugar
	No.	Mds.	Mds.	Mds.
Bihar and Orissa.	14(*a*)	3,283	1,121	898
United Provinces.	10	957(*b*)	810	1,777
Madras ...	5	720(*f*)	98(*g*)	792
Bengal ...	7(*a*)	...	...	2,895
Other Provinces ...	2(*d*)	222	104	306
Total ...	38	5,182	2,133	6,668

Province	Molasses produced from		Maximum production		Average number of persons employed daily
	Cane	Raw sugar	Sugar	Molasses	
	Mns.	Mds.	Mds.	Mds.	No.
Bihar and Orissa.	2,016[3]	804	5,532	2,812[5]	3,544
United Provinces	1,082[3]	1,895[3]	5,041	4,747[3]	2,081
Madras ...	577[3]	479	2,276	1,389	2,986
Bengal ...	...	125[3]	3,537	217[3]	891
Other Provinces.	90	180	352	280	153
Total ...	3,765	3,483	16,758	9,445	9,652

(a) *Three factories in Bengal and one factory in Bihar and Orissa worked on an average 10 hours a day.*

(b) Includes production of second sugars in one factory, separate figures not being available. The high proportion of second sugars is due to the fact that ration sugar of about 97 degrees polarization manufactured for the Army Department has been classed under "second sugars.",

(d) One in Burma and the other in Baroda.

(f) Includes 580 maunds from cane and raw sugar.

(g) Represents production ,,

[3] Excluding production of molasses in one factory in Bengal, and two factories each in Bihar and Orissa and the United Provinces, information not being available.

[4] Includes 496 maunds from cane and raw sugar.

[5] *Excluding the figure for one factory.*

The Department highly appreciates the invaluable assistance given for the second time by manufacturers throughout India in the present enquiry.

BRUSSELS CONFERENCE REPORTS.

[In forwarding the reports of the delegates for India to Brussels Conference, the Government of India in a covering letter to the Chambers of Commerce, etc., invite opinion to work out the scheme on international credits, the importance of which to India's export trade need not be emphasised. It is essential, they point out, that for any such scheme to be of practical value so far as India is concerned, bonds in question must be fully negotiable. They also emphasise that the present depression in export trade is no doubt partly due in the case of some exports to the existence of large unused stock in foreign countries but in the case of other exports it is probably due to lack of credit facilities. The following is the text of the Report of the Delegates :—Ed., *M.E.J.*]

The International Conference was convened by the League of Nations "with a view to studying the financial crisis and looking for the means of remedying it and of mitigating the dangerous consequences arising from it." The original intention was that the Conference should be held about the end of May 1920, but it was, for various reasons, postponed, and it finally assembled at Brussels towards the end of September under the presidency of M. Gustave Ador, ex-President of the Swiss Republic. In all no less than 39 States were represented, and the Conference held 17 sittings, commencing on the 24th September and concluding on the 8tb October. In the invitations issued to the members of the League of Nations the Council of the League requested that each Government should send not more than three delegates conversant with public finance and banking as well as with general economic questions. The delegates appointed to represent India were :-

Mr. H. F. Howar[illegible] [illegible]y to the and at present Controller of Finance, India Office.

Sir Marshall Frederick Reid, late member of the Council of the Secretary of State for India, and previously Chairman of the Bombay Chamber of Commerce.

Sir Fazulbhoy Currimbhoy, a prominent member of the Bombay business community, late President of the Bank of Bombay and for several years a member of the Viceroy's Legislative Council.

2. The Conference was opened by an address by the President, M. Ador. Copies of this, as also of the general proceedings of the Conference, have been submitted as the Conference proceeded, and the conclusions arrived at by the Conference are embodied in its report (Appendix A). It will, therefore, be sufficient in the present report to give a brief ontline of the proceedings, merely referring to matters of special interest from the point of view of India. The address by the President was followed by the presentation of written statements from each country setting out its general financial situation, including its budget situation, internal and external debt, currency, exchange, foreign trade, import and export restrictions, exchange control, etc., and the present policy of each Government on these questions. These statements were introduced by each delegation in a brief speech. Many of these statements were of much interest, and the bulk of the delegations were at pains to show the efforts which their countries were making to arrange their finances, etc., on sound lines.

3. While fully realising the difficulty of the problems with which India has to deal at the present time as the aftermath of war, the Indian delegation could not fail to be impressed with her great inherent financial and economic strength, if her position be compared with that of the bulk of the participants in the Conference. To quote from the opening sentence of the Conference resolutions :

nations have in turn placed before the International *Financial Conference* a statement of their financial position. The examination of those statements brings out the extreme gravity of the general situation of public finance throughout all the world, and particularly in Europe. Their import may be *summed up in the statement that three* out of every four of the countries represented at this Conference, and 11 out of 12 of the European countries, anticipate a budget deficit in the current year." Apart, too from the fact that India has emerged from the war with her resources relatively unimpaired, she stands in a special position at the present time and possesses special opportunities inasmuch as she has a surplus of important commodities, to dispose of, whereas many countries are suffering from a deficiency of foodstuffs and raw materials and from a depreciation of their currencies which make it impossible to carry on the normal process of production or even to set its machinery once again in motion.

4. The written statement (Appendix B) of the delegates for India, while briefly reviewing her financial situation, brought out the fact that she is able to export considerable supplies of various commodities as regards which the Government of India had furnished information, and Mr. Howard in his speech (Appendix C) emphasised that she is anxious to so assist the world's reconstruction by loing so, provided that satisfactory financial urrangements can be made.

5. Apart from the above review of the inancial and economic situation of the various countries, the main business of the Conerence consisted in a discussion on financial policy. The field was sub-divided into the our following subjects, a separate debate on each subject being opened by the Vice-President, whose name is noted against it:—

(1) Public Finance, Hon. R. Brand, England.

(2) Currency and Exchange, Dr. Vis-[illegible] Holland.

(3) International Trade, M. de Wouters d'Oplinter, Belgium.

(4) International Credits, M. Celier, France.

6. In opening the first debate Mr. Brand gave a striking address setting out the correct principles which should govern the conduct of public finance. Mr. Howard had submitted his name to speak on this debate the acceptance of the principles set out by Mr. Brand appeared to be of fundamental importance from the point of view of the re-establishment of international credit, in which India is vitally interested; but as these principles were not questioned in any quarter, he considered it sufficient to confine himself to a few remarks (Appendix D) noting the universal acceptance with which these principles had met.

7. In the debate on currency and exchange, the delegates were in full accord with the views stated by Lord Cullen, representative of Great Britain and considered it unnecessary to intervene. A paper read by Mr. Strakosch, delegate for South Africa, with regard to the future of gold, possess special interest for India (Appendix E).

8. In the debate on international trade the question of tariffs was touched on and it seemed possible that this might be made an important issue. Sir Fazulbhoy Currimbhoy accordingly intervened in the debate to emphasise that while India was anxious to co-operate in the world's reconstruction, there was a strong body of public opinion in India which favoured a policy of protection for her industries, and he urged that the question of tariffs should be excluded from discussion as not relevant to the matters actually at issue. A copy of his remarks is appended (Appendix F).

9. Special interest centred in the debate on international credits, since this afforded an opportunity for constructive measures. The Conference had before them numerous schemes varying widely in scope and apparent practicability. That of M. Celacroix, Prime Minister of Belginm, had perhaps

attracted most attention, and formed a starting *point for discussion. It was, however,* generally felt that his proposals were on too ambitious a scale, and the Indian delegates think they are correct in stating that Sir Marshall Reid (vide copy of his speech as Appendix G) focussed the general sense of the Conference in urging that what was required for the purposes of reconstruction was not the setting up of entirely new, expensive and untried machinery but an attempt to repair and lubricate the machinery which was already existing though it had in large measure fallen into disuse. This point of view was further developed by Mr. C. E. ter Meulen (Holland), and a scheme outlined by him formed the basis of discussion later.

10. After the formal debates in plenary session, the separate heads of discussion were referred to general committees for the purpose of preparing draft resolutions for the adoption of the Conference. On these committees each country was allowed one representative, India's representation being as follow:—

(1) Public Finance, Mr. Howard.
(2) Currency and Exchange, Sir Marshall Reid.
(3) International Trade, Sir Fazulbhoy Currimbhoy.
(3) International Credit, Sir Marshall Reid.

Each committee in turn selected from its members a small "drafting committee," which was entrusted with the active preparation of the drafts for consideration of the main committees. Sir Fazulbhoy Currimbhoy and Sir Marshall Reid were selected to serve on the drafting committees in the case of International Trade and International Credit, respectively. The draft resolutions so prepared were, after approval by the main committees, presented to the Conference and passed without a dissentient vote.

The resolutions of the Conference (of which copies will be found as enclosures I, II, III and IV of Appendix A) have already been published. The delegation found *themselves able to subscribe to these without* reservation, and it is only to the resolutions with regard to international Credit that they desire to make any further reference. The operative part of this group of resolutions is contained in paragraphs 8 and 9 of Appendix A, Enclosure IV. The scheme referred to in paragraph 8 as Annex A had the support of a number of delegates of great international experience, who expressed confidence in its practicability. Paragraph 9 of the same group of resolutions refers to a scheme put forward by Sir Marshal Reid (a copy is attached as Appendix H). This proposal was made by Sir Marshall Reid in the light of commercial experience, and he explained that he could not in any way commit his Government. The Indian delegates wish to say, however, that Sir Marshall Reid's proposal was elaborated with the full concurrence of his colleagues, who considered that its adoption would materially conduce to more normal conditions in the consuming markets, with corresponding advantages to the producers of raw materials. They suggest, therefore, that an early expression of the views of the Government of India in this matter should be obtained. For, while some delay is inevitable before a definite conclusion can be arrived at on the practical recommendations of the Conference, serious consideration of these recommendations will begin at an early date, and the various countries affected will then be expected to define their attitude at short notice.

12. Apart from the four committees mentioned above, a further important committee was appointed "to consider the principles on which the expenses of the League of Nations should be distributed among its members and to make recommendations for a new basis of apportionment." Mr. Howard was a member of this committee and of its drafting committee. The report of the committee was not published, M. Ador, the President, informing the Conference that this would be

orwarded to the Council of the League of Nations.

13. In conclusion, the Indian delegation wish to say that it has been a great privilege to them to take part in this historic and instructive Conference. The general atmosphere of courtesy and good-will, and the desire to find common ground where points of view were necessarily divergent, were very remarkable. The delegates also desire to acknowledge the great hospitality which was extended to the delegations by the Government and people of Belgium.

(Sd.) H. F. HOWARD.
„ MARSHALL REID.
„ FAZULBHOY CURRIMBHOY.

LONDON, October 14.

THE INDIAN SCHEME.

The following is Sir Marshall Reid's Scheme referred to above:

'In accordance with Annexe A there will be created:—

(*a*) The undertaking of the buyer to fulfil his contract.

(*b*) The assurance of the buying country that he is probably capable of doing so.

(*c*) The confirmation of the assurance by the Central Commission.

(*d*) The bond of the buying country to be handed over to the seller for use as collateral.

While supporting the scheme of M. ter Meulen (Annexe A), the Indian Delegation are of opinion that it will serve only a limited practical purpose, and that it will be of little practical value to countries which are remote from Europe, but which produce so much of the raw materials essential for reconstruction. They are of opinion that the bonds created under Annexe A will not be acceptable as collateral except at a considerable discount by the banks abroad to which they look to finance their shipments. The [illegible] will thus remain with the seller will seriously affect the usefulness of the scheme.

The aim of the present proposal is to create a bond which will be of value in international markets, and will be readily accepted by banks as collateral at approximately its face value, in fact will be practically equivalent to a confirmed letter of credit.

The following are the outlines of the scheme:—

(1) The bond created under Annexe A [paragraph (d) above] would be delivered to the Central Commission instead of being handed over to the seller. The Central Commission would retain it as collateral and issue in its place a "Central Commission Bond," which would be secured under a limited joint guarantee of the countries or bodies participating in the scheme.

(2) The Guarantee Fund would consist of an unlimited number of shares of such value as may be considered convenient. Subscribers would be entitled to an allotment of "Central Commission Bonds" which would bear the same proportion to the total permissible issue of bonds as their share contribution would bear to the total amount subscribed. Thus if the ratio of 10 to 1, as suggested in paragraph 4, were adopted, each subscriber of, say, 10,000 l. would be entitled to an allotment up to 100,000 l. in bonds.

(3) Seeing that Central Commission Bonds would have the full benefit of the security of Annexe A Bonds, it may be fairly assumed that the calls on the guarantee would at the worst amount to a very small proportion of the transactions carried through under the collateral of the bonds.

(4) It is therefore suggested that the volume of transactions current at one time under the system might quite safely amount to ten times the amount of the guarantee. Thus if shares were subscribed to the amount of say, 10 l. millions gold, transactions up to 100 l. millions gold be guaranteed.

(5) Subscribers would not be required to pay for their shares in cash, but would furnish such securities as the Central Commission required; the risk of each subscriber would be definitely limited to the amount of shares subscribed.

(6) Central Commission Bonds would be available for use only in connection with transactions between countries or bodies who were subscribers.

(7) The Central Commission Bonds for transanctions between two subscribers might be furnished either from the allotment of the buying or selling subscriber. This would provide the buying parties with bonds in excess of their allotments, provided always that they were able to furnish Annexe A Bonds for the full amount.

(8) On the completion of the transaction, the bonds would be returned to the Central Commission who would cancel them and return the relative Annexe A Bonds to the buying country.

(9) The maturity of the bonds would be the same as in the case of the Annexe A Bonds.

(10) The Central Commission would publish periodical statements showing such important particulars as total bonds current and totals of each buying and selling country—also total of Annexe A Bonds of each country in its keeping.

(11) A commission would be charged on all "Central Commission Bonds" to cover expenses and to compensate guarantors.

(12) It might be that some countries might not find themselves in a position, for one reason or another, to participate as a nation in a scheme of this sort, but it would be quite open to a trade or section, *e.g.*, the cotton growers of America, to join in the guarantee, and to get the full pro rata benefit of it.

(13) Bonds under Annexe A scheme would only be issued to buying countries for limited quantities of specific commodities and Central Commission Bonds would only be issued for the same commodities, but it would be open to selling subscriber independently to restrict the purposes for which their bonds should be utilised.

(14) If the Central Commission had at any time reason to fear that heavy calls were likely to be made in the near future, they might have to consider the expediency of restricting or discontinuing the issue of further bonds until the situation cleared and it became evident that the amount of the Guarantee Fund was ample to cover the risks in outstanding transactions.

NOTE.—M. Celier, Vice-President, has kindly promised to submit these proposals to the League of Nations for the consideration of the Committee which will deal with the Conference resolutions on International Credits, particularly paragraphs 8 and 9.

THE MEULEN SCHEME.

Regarding International Credits, the Brussel Conference make the following recommendations :—

8. An international organization should be formed and placed at the disposal of States desiring to have resort to credit for the purpose of paying for their essential imports. These States would then notify the assets which they are prepared to pledge as security for the sake of obtaining credit, and would come to an understanding with the international organization as to the conditions under which these assets would be administered.

The bonds issued against this guarantee would be used as collateral for credit intended to cover the cost of commodities.

A plan based upon these principles is developed in Annex. A. It has been devised to enable States to facilitate the obtaining of commercial credits by their nationals. It is easy to see that the scheme is susceptible of development in various directions and that some of its provisions might be adapted so as to facilitate the extention of credit direct to public corporations.

A committee of financiers and business men should be nominated forthwith by the Council of the League of Nations for the purpose of defining the measures necessary to give practical effect to this proposal.

2. It has been represented to the Conference that more complete results might be achieved if the bonds used as collateral were to carry some international guarantee.

The Conference sees no objection to the further consideration of this proposal. The Committee referred to in paragraph 8 above might usefully consider the conditions under which it could be applied.

ANNEX A.—INTERNATIONAL CREDIT.

1. In order that impoverished nations, which under present circumstances are unable to obtain accommodation on resonable ... market may be able to command the confidence necessary to attract funds for the financing of their essential imports, an International Commission shall be constituted under the auspices of the League of Nations.

2. The Commission shall consist of bankers and businessmen of international repute, appointed by the Council of the League of Nations.

3. The Commission shall have the power to appoint Sub-Commissions, and to devolve upon them the exercise of its authority in participating countries or in groups of participating countries.

4. The Government of countries desiring to participate shall notify to the Commission what specific assets they are prepared to assign as security for commercial credit to be granted by the nationals of exporting countries.

5. The Commission, after examination of these assets, shall of its own authority determine the gold value of the credits which it would approve against the security of these assets.

6. The participating Government shall then be authorised to prepare bonds to the gold value approved by the Commission each in one specific currency to be determined on the issue of the bond.

7. The date of maturity and the rate of interest to be borne by these bonds shall be determined by the participating Government in agreement with Commission.

8. The service of these bonds shall be secured out of the revenue of the assigned assets.

9. The assigned assets shall in the first instance be administered by the participating Government, or by the International Commission as that Commission may in each case determine.

10. The Commission shall at any time have the right of making direct representations to the Council of the League of Nations as to the desirability of transferring the administration of the assigned assets either

from the Commission to the participating Government or from the participating Government to the Commission.

11. The decision of the Council of the League of Nations on this question shall be binding.

12. After the preparation of theae bonds the participating Government shall have the right to loan the bond to its own nationals, for use by them as collateral security for importations.

13. The bonds shall be made out in such currencies and in such denominations as are applicable to the particular transaction in respect of which they are issued.

14. The participating Government shall be free to take, or not to take, security for the loan of these bonds from the nationals to whom they are lent.

15. The maturity and the rate of interest of the loan of the bonds shall be fixed by agreement between the participating Government and the borrower of the bonds; they need not be the same as the maturity and the rate of interest of the bonds themselves.

16. When making application to his government for a loan of these bonds, the importer must furnish proof that he has previouly obtained from the International Commission express permission to enter into the transaction for which the bonds are to be given as collateral.

17. Each bond, before it is handed over by the participating Government to the importer, shall be countersigned by the Commission in proof of registration.

18. Having obtained the consent of the Commission, and received from them the countersigned bonds, the importer will pledge these bonds to the exporter in a foreign country for the period of the transaction.

19. The exporter will return to him on their due dates the coupons of the pledged bonds, and the bonds themselves on the completion of the transaction.

20. On receipt of the coupons and the bonds, respectively, the importer will return them to his Government.

21. Bonds returned to the participating Government shall be cancelled, and may subsequently be replaced by other bonds, either in the same or in different currency, up to an equivalent amount.

22. The exporter, or if he has pledged the bonds, the institution with which he has repledged them, acting on his behalf, would be free, in the event of the importer not fulfilling the terms of his contract, to bold until maturity the bonds given as collateral by the importer, or to sell them in accordance with the custom in his country in case of default.

23. In the second alternative an option of repurchasing the bonds direct must first be given for a short period to the Government which issued them.

24. If a scale is resorted to and results in a surplus beyond what is necessary to cover the claims of the exporter upon the importer, the exporter shall be held accountable for that surplus to the Government which issues the bonds.

25. The revenues from the assigned assets shall be applied as follows to the service of the bonds.

26. Out of these revenues the Commission or the participating Government, as the case may be, shall purchase foreign currencies sufficient to meet at their due date the coupons on all bonds at any time outstanding in the different foreign currencies.

27. In addition they shall establish abroad in the appropriate currencies a sinking fund calculated to redeem at maturity 10 per cent of the bonds outstanding in each of the different countries.

28. Further, in addition to the amounts provided for payment of coupons and for the endowment of the sinking fund they shall establish out of the assigned revenues a special reserve in one or more foreign currencies for the redemption of bonds sold in accordance with paragraph 22

29. The amount to be set aside for the special reserve shall in each case be determined by the Commission.

30. Any surplus remaining at the end of each year after the provision of these services shall be at the free disposal of the participating Government.

31. A participating Government shall have the right to offer its own bonds as collateral for credits obtained for the purpose of importations on Government account. The previous assent of the Commission will in these cases also be required for the particular importations desired by the participating Government.

32. If a participating Government which has been in control of its assigned revenues should fail to fulfil its obligations, the exporter concerned will notify the Commission and the Commission will apply to the Council of the League of Nations for the transfer of the management of the assigned revenues to the Commission.

33. The consent of the Commission is necessary whenever bonds secured on the assigned assets are given as collateral, and shall, as a rule, be accorded only for the import of raw material and primary necessities.

34. The commission may, however, at its discretion, sanction in advance the importation of specified quantities of such goods.

35. Even in the case of imports under such a general sanction a notification of the particular transaction must be registered with the Commission.

36. The assent of the Commission must also be obtained in every case to the term of the credit which it is proposed to open.

ECONOMICS IN THE WEST.

Supply of Motor Fuel.

London, 21st October, 1920.—It is becoming increasingly evident that the provision of an adequate supply of motor fuel is likely soon to be one of the principal industrial and economic problems of the day. On the one hand there are vast changes proceeding in the way of the development and extension of the uses of motors;—(America, for example, is likely to have in 1922 no fewer than 12,000,000 motor cars against less than a million in 1912.) On the other there is a steadily growing shortage in the supply of petroleum—a shortage which, failing other sources of supply being discovered additional to those now in existence, most rapidly augment in stringency as the years go by. The crisis may be postponed if the motoring world is sufficiently alert to anticipate it, but if nothing substantial is done to extend the area from which motor fuel is drawn Admiral Philip Dumas, Secretary to the Royal Commission on Oil Fuel in 1913, predicts that there will be such limited supplies forthcoming in 1922 as to necessitate the entire disuse of motor cars by private owners in this country, and presumably in other parts of the Empire which are dependent for their supplies upon the same sources. In these circumstances it is readily to be understood that great interest has attached to the proceedings of the Imperial Motor Transport Conference which has been held this week in association with the Commercial Vehicle Exhibition of the Society of Motor Manufacturers and Traders at Olympia. The Conference was un-official but the fact that it was presided over by Sir G. Beilby, Director of Fuel Research, Department of Scientific and Industrial Research, gave it an undoubted stamp of authority.

From the extremely interesting debates which took place—debates in which some o

the greatest scientific experts of the day in this particular line took part—the fact emerges that there is a wide and profitable field open for the extension of the existing sources of fuel supply. Apparently no great reliance is placed on the discovery of new petroleum oil fields though obviously there are immense possibilities in this direction in many parts of the world in which no surveys have been made or in which only imperfect investigations have been conducted. What the Conference mostly concerned itself with was the practicability of augmenting the petroleum supply by the manufacture of spirit from various natural products. In this respect power alcohol had the first claim to attention. The material from which alcohol can be distilled is of infinite variety and nowhere is it to be found in greater abundance than in the tropical regions of the Empire where climatic conditions favour cheap production. Sugar and rice straw were mentioned as suitable agencies for the manufacture of power alcohol and you in India do not need to be told that the coconut palm and the bastard date and mhowra flower are also available for spirit production. Probably there are other equally valuable sources of supply amongst tropical growths which at present have no great commercial value. The subject at all events is of transcendent importance in connection with the economic development of India and there should be hearty co-operation on your side with the efforts that are now being made here to create an alternative supply of motor fuel from outside the mineral oil field. If, as seems probable on the facts disclosed at the Conference, power alcohol has a great future as a motor spirit, there is room for a vast new industry in India—an industry which would stimulate agriculture and give lucrative employment to tens of thousands in the processes of manufacture.

Apart from power alcohol the experts are hoping to find what is needed to augment the petrol supply in products which at present are not utilised as they might be for the purposes in view. Mention was made of Irish peat, but without any very great hopes of working the material successfully. The difficulty appears to lie in the absence of any efficient method of de-hydrating the material. If it were possible successfully to dry the peat by artificial means there would be in the Irish peat beds—a speaker at the conference asserted—sufficient deposits to produce 150 years supply of spirit, at the present rate of consumption, for the United Kingdom. It is, however, in the manipulation of raw coal that the best prospects of success are to be found. Benzol can be produced in enormous quantities from our existing supplies if we are prepared to change our methods and use coal as it should be used so as to yield this highly valuable by-product. As we were reminded at the Conference, some years since that distinguished scientist, Sir William Ramsay suggested that instead of mining coal with a great expenditure of labour, we should make the attempt to gasify the coal *in situ*. Assuming this process to be in operation we should have a series of bore holes made into the coal bed and gas produced by the right methods and drawn to he surface through other bore holes made for the purpose. The prospect of eliminating the miner altogether from the operations makes a special appeal at the present time when we are in the throes of one of the greatest—if not actually the greatest—coal strike in our history; but it is to be feared that the project is somewhat Utopian and that we shall have to rely upon more prosaic methods if we are to utilise our coal for benzol production. It was suggested, indeed, at the Conference by Professor W. A. Bone that the idea of using coal to produce a vapour for power purposes is wrong and that we should be likely to obtain far better results if our experts concentrated upon the discovery of means by which compressed or solid fuel prepared from coal might be used for motor propulsion. He instanced [illegible]

of which there are vast supplies in Canada and Australia—as a potential agent of great value, and recommended that the question of its use in the manner he proposed should be thoroughly investigated. From several points of view the Conference was of exceptional interest and importance and it should lead in the near future to developments which will aid to modify if not entirely to neutralise the effects of the petrol shortage.

THE SCHEME OF POWER TRANSMISSION.

The Scriptural turning of swords into ploughshares has its analogy in a number of the after proceedings of the great War. Most of those who followed the operations of the Air Force will remember the frequent mention of the device by which machine guns were enabled to fire bullets though the propellers of the aeroplane at the rate of 2,000 a minuate. This ingenious contrivance was based on the invention of a Roumanian engineer, Mr. George Constantinesco, who utilised a system of propagating impulses through liquid on principles which through very simple are not easy to explain in brief terms. Generally it may be said that the idea is to take a column of water or other liquid, confine it in an unyielding pipe and at one end administer a rapid and regular succession of blows to the water by means of a reciprocating piston or plunger. In this way the water is compressed with the repeated blows of the piston and these compressions travel along the whole length of the pipe operating at the other end a second piston which works in unison with the movement of the first piston. There is no flow of water along the pipe: the vibratory movements are simply transmitted along the column of water. Valuable as this invention was when applied to machine guns on aeroplanes it is likely to be of even greater utility in the domain of industry. Recently it has been used in connection with rock drilling, the scheme of power transmission being availed of to operate rock drills which depend for the delivery of a series of blows in rapid succession. Recently there was a demonstration of the working of invention in association with rock drills at the works of Messrs. W. H. Dorman and Co. of Stafford who are the licensees of the system. In this instance a hole 47½ inches deep was drilled in a block of Cornish granite in 13 minutes, the drill being operated by a generator which absorbed about 12 horse power. An Ingersoll compressed air drill which was put upon the same work took 15 minutes to complete the bore and this with the service of as much as 27 horse power at the air compressor. It is claimed that the wave power drill is so economical in working that if used in the Rand gold mines it would save as much as a half million pounds in the year. There seems to be a great future for the inocution.

BRITISH TRADE WITH INDIA.

Mr. Thomas Ainscough's paper on British trade with India at the Society of Arts last week was a well considered and suggestive survey of the existing industrial and economic situation in India. An optimistic note ran through the speaker's references to the financial stringency which has followed upon the fall of exchange. The unsatisfactory conditions prevailing he regards only as temporary and he looks forward to a trade revival of an encouraging kind in the not distant future. Perhaps the most instructive part of the paper was that in which Mr. Ainscough dealt with India's industrial renaissance. He pointed out how during the last three years of the war India had enjoyed phenomenal prosperity culminating in the great industrial boom of last year. The inevitable tendency to over capitalization shown in the floating in the year ended March 31st last of 906 companies with an aggregate capital of £ 183,000,000, was touched upon. But Mr. Ainscough was not discouraged by this display of industrial independence which he regarded as a natural development of a situation in which special needs had been created. British shipments

may he thinks fall off in certain directions as a consequence of these Indian developments, but the loss he believes will be more than made good by dealings in articles of a wider range and a superior class which India's prosperity has placed within the reach of her people. Moreover, the development will provide great scope for the operations of British financiers and industrialists. There is urgent need of directing force and ability, experience of modern and scientific conditions of industry and expert foreman and artisans to train available labour. "These," says Mr. Ainscough, "can only be provided from overseas, and it would appear that unless British financiers and manufacturers are prepared to seize the opportunities offering there is a risk that foreign interests may become established in the country." In harmony with these views Mr. Ainscough holds that India's aspirations for industrial independence are natural and legitimate and he reasonably warns British *entrepreneurs* to do nothing to alienate Indian sympathies. He advises British manufacturers who are intent on commencing operations in India to enlist the co-operation of Indian capital and wherever practicable to allow it representation on the board of directors as a means of securing that friendly association which is invaluable in dealing with many local problems. There was much in the paper to give food for thought to those who are concerned in the prosecution of British trade in the new era we have entered upon and Mr. Ainscough's observations should have a valuable effect in dissipating misconceptions and prejudices creating the right atmosphere in which to establish the relations of British and Indian trade under the changed conditions.

Development of Commercial Aviations.

The future of commercial aviation is a fascinating study and it becomes the more fascinating the further we get from war conditions. At the recent air conference at the Guildhall many opinions were expressed as to the lines upon which development of commercial aviation should proceed, but there was practical unanimity for the view that Great Britain had it in her power to secure supremacy in this sphere if she elected to make full and proper use of her resources. Emphasis was laid by more than one speaker of eminence in the aviation world upon the urgent necessity of developing the long lines of communication which run through the British Empire. The carriage of masts to India by air was especially insisted upon as the purest guarantee of the ultimate success of any world scheme. What India gained in the way of speedy communication, it was argued, Australia and New Zealand and the Far East would soon demand and the day would come when correspondence by letter with the most distant of centres in Australia and the East would be possible within a period measured by days where weeks are now occupied. Curiously enough some opposition was shown to the idea of Government subsidies. Forgetful of the fact that the Indian and Far Eastern mail service was originally built up on a subsidy to the P. and O. Company some speakers spoke of financial aid of this character as an undesirable innovation. It is probably that when a scheme of distant aerial mail communication is evolved it will be found to differ little in its main principles from the ocean mail system. Only by such means will it be possible to carry on a regular service in all seasons and during all weathers to say nothing of the financing of a venture sufficiently strong to outlive the almost inevitable losses of the preliminary period.

ARNOLD WRIGHT.

INDUSTRIAL NOTES FROM THE UNITED STATES.

The Hudson Tunnel for Vehicles.

Washington, D.C., U.S.A., Oct. 26, 1920.—A red letter day in the history of the world's urban transportation was October 12, of this year, when the governor of the state of New Jersey and the governor of the state of New York broke ground inaugurating the construction of the much-planned-for vehicular tunnel beneath the Hudson River, the first great tunnel of its kind to be constructed in the world. Tunnels somewhat after this character have been built before, notably the Rotherhithe tunnel, London, and one beneath the Elbe at Hamburg. But these two, because of their shorter length, are not burdened with the great problem of artificial ventilation, which renders the construction of the great Hudson River tunnel so formidable an undertaking.

The twin-tube structure one and one-third miles from end to end, and the outer diameter of each tube will be 29 feet. The Rotherhithe tunnel has a span of 1,570 feet between the ventilating shafts, whereas there will be stretch of 3,900 feet beneath the tide and between the off-shore ventilating shafts. Of these last-named there will be four—two near the pierhead lines and two inshore, near the tunnel exits and entrances. A cross section of the tubes shows that they will be divided horizontally by two portions, the upper chamber being used for the outflow of the foul air, the lower chamber for the inflow of fresh air, and the middle chamber being devoted to traffic. The road-bed will be 20 feet wide, with a clearance of 13 feet, 6 inches between the floor level and the under side of the ceiling.

To ventilate the tubes there will be provided 65 electrically-driven fans which will be sufficient to effect a complete change of the air 32 times every hour. The operation of the ventilating system at maximum capacity will call for the annual expenditure of $280,000. The traffic is estimated for the first year at 119,000 horse-drawn vehicles and 2,686 motor vehicles, and in the tenth year the figures show a potential one-tube traffic of 68,000 horse-drawn as against 5,916,000 motor vehicles. Twenty years from the opening of the tunnel it is estimated that the dual route should be handling a total of 15,800,000 motor vehicles in the twelve month.

The cost of the tunnel is now put down at $ 28,669,000, which will be divided equally between the two states. It is expected that, in eleven years, the operating revenue will have yielded sufficient income to amortize the cost of the tubes, and that at the end of twenty years each state will have to its credit a surplus of $33,635,000, or suffieient to build another double-tube tunnel. In three and a half years the tubes should be open, and the intolerable congestion and delay of the present ferry service (which has never been adequate) will become a thing of the past.

HOME MOTION PICTURES IN DISK FORM.

It has remained for one of the American pioneeer workers in the field of motion pictures and the inventor of one of the most successful processes of natural-color motion pictures, to introduce a simple motion picture apparatus for home and kindred uses. By replacing the usual film with flexible disks this inventor has simplified and reduced the cost of motion pictures to a point where they are available in almost every home.

The basis of the present system is a transparent disk on which the images are arranged in a continuous spiral. It has been found impractical to utilize a disk negative for photographing the subjects, hence the process makes use of standard positive motion-picture film which is projected in greatly reduced form into the master disk. Once this master disk, which is a negative, is obtained, it is possible to print any number

of positive disks for use in the projector. This reduction process requires most precise handling, and it was only after many years of careful, constant development that the present successful results were obtained.

The projector embodies the usual elements. It has an incandescent lamp, condenser, shutter, lens and an intermittent gear. The operation starts with the first image on the outer turn and follows the spiral to the innermost image. Obviously, the pictures do not have to be rewound, as with standard film.

The actual size of the images is $\frac{7}{32}$ of an inch by $\frac{5}{32}$ of an inch. The 11 inch disk contains 1,200 pictures, or the equivalent of 75 feet of film, exclusive of titles. Only two frames are devoted to titles, since the machine can readily be stopped when a title is reached, and then started up again, thus saving a great number of frames. In this manner the record may be said to equal the usual 100 foot run of film with titles. This matter of being able to stop the pictures at any point also aids in studying any given bit of action—something which is generally impossible with machines utilizing regular film.

By removing the lamp and substituting a small mirror the projector can be used by an individual for viewing a picture without going to the trouble of putting up a screen, darkening a room and making the necessary electric connections.

A MOBILE SHOE-REPAIR SHOP.

Two special trucks built by a well known Detroit, Michigan, manufacturer, and especially equipped for use by the United States army, as mobile shoe-repair shops, recently made a test trip from Boston, Mass., to Washington, D. C. The purpose was to show how easily such an outfit can be moved from place to place, what speed can be maintained, and how it will stand up under a 500 mile road trip.

The first truck carries all of the necessary machinery for remaking and repairing shoes, which is driven by a separate motor connected with the driving shaft of the standard stitching machine, the nailer, the scouring and finishing wheels. This motor also furnishes electric lights through a dynamo, and heating facilities are provided through registers connected with the exhaust.

The second truck is equipped as a supply depot, and carries all of the materials for repairing soldiers' shoes, such as sole leather, heel lifts, hob nails, tacks, welting and other necessary findings as well as extra machine parts for both the trucks and machinery. This supply truck can also be used to dispatch repaired shoes to various points along the lines where troops are located. Army officers estimate that approximately 1,000 pairs of shoes a day can be tapped when the mobile outfit is running with a day and night crew of seven men. There is also carried a complete set of apparatus to pull the trucks out of snow drifts or mud, consisting of ground anchor, winches, ropes, chains, picks, and shovels.

8,000,000 Automobiles in Use in United STATES.

That the United States automobile industry's greatest future lies in future countries where people are realizing the advantages of motor vehicles for the transportation of passengers and freight, is the opinion unanimously held by the members of the National Automobile Chamber of Commerce. The importance of the foreign markets may be readily inferred from the fact that there is in the United States one car for every 14 inhabitants and throughout the world the ratio is one car for every 2,870 inhabitants.

This country is now using eight million motor vehicles, of which 850,000 are trucks, and, with production this year, about 2,000,000 motor vehicles.

The modern motor vehicles has already geared America to a new efficiency in commerce, provided a new standard of life and inaugurated a new philosophy of thought.

It must take the same position in other countries of the world, just as soon as the people fully appreciate its time-saving value.

Our exports of cars and trucks, which represented 8 per cent of the value of all completely manufactured United States products shipped abroad, amounted to 139,875 vehicles, valued at $ 166,961,709; whereas those of all automotive products exceeded $220,000,000 during the last twelve months. Automobiles are now being exported from the United States to more than 90 different countries of the world. Shipments of these are by no means limited to the older European countries. Uruguay and China have been better purchasers of cars than has France, while Argentina ranks higher than any of the older Scandinavian countries. The snows of Iceland and the Faroe Islands have not prevented their inhabitants from buying from the United States both motor trucks and passenger cars, whereas in the Belgian Congo the motor trucks and passenger automobiles imported from the United States last year are demonstrating the true value of motor vehicles as a means for opening up sections rich in tropical products and yielding immense returns.

The states of Iowa and Nebraska have a car for every six people; American formers own 2,500,000 cars; 155,000 motor vehicles bring freight and passengers from the surrounding country to Manhattan Island (New York) every day. In fact, the power-driven vehicle has added so much to the productivity of America, and in so many and divers ways, that other countries are hastening the day when they can use them in large numbers.

WOOD CHARCOAL and ITS MANUFACTURE.

The uses to which wood charcoal is put are numerous, chief among which may be mentioned its use as a source of cheap power for running gas suction engines, for smelting purposes and for smitby work. It is also used as a smokeless fuel and in the manufacture of ammunition.

Government scientists have made analyses of wood charcoal, the results of which are most interesting. On account of its porous nature and the very large internal surface it contains charcoal has the power of absorbing large amounts of gases. Similarly, charcoal, especially bone charcoal, prepared by heating bones, will absorb coloring matters from solutions, so that it finds a considerable application as a decolorizing and deodorizing agent. It is utilized also for insulating purposes, as it is a bad conductor of heat and electricity, and it is given to poultry in crushed form. The chief constituents of wood, say the investigators, are cellulose and lignin, both rich in the element carbon, and when wood is burned in the presence of air, light, heat and gases are produced, while ashes containing the mineral constituents of the wood form the residne. When heated to high temperatures without free admission of air most of its organic substances (lignin, cellulose, etc.) are decomposed and given off as gases, a residue of impure carbon remaining. This impure carbon residuum is called charcoal, and it consists almost entirely of the element carbon mixed with a certain amount of still undecomposed carbon compounds and the inorganic constituents of the wood chiefly in the form of potassium carbonate.

SOMETHING NEW IN GASOLINE-DRIVEN PLOWING MACHINES.

We are told that there is nothing new under the sun. In a broad sense this is probably true, but variation in the application of certain well-recognized principles frequently creates machines that may, without exaggeration, be properly classed as extremely original. Such is undoubtedly true of the plowing machine now in successful operation in this country.

What, at a distance, appears to become queer development of a flying machine, with its wings outstretched, resolves itself at closer range into an interesting but distinctive type of plowing machine.

To a person unfamiliar with mechanics the initial sight of such a machine is somewhat astounding, but keener observation, particularly when the plow is in motion, impresses one with the vast possibilities of such a unique machine.

The design of the machine is much out of the ordinary, and is a radical departure from the usual present day practice of tilling the soil. The designer of the machine has made several successful trials and all of its performances up to this time have more than met the fullest expectations of the inventor and builder as well as of others who are interested in its wonderful possibilities.

Unlike the ordinary plow, where the furrows are made parallel to the travels of the machine, the method of operation of this plow causes the plow shares to move at right angles to the forward movement of the tractor, resulting in a furrow that converges toward the center at an angle of about 20 degrees, leaving the plowed land with a herringbone appearance.

In operation, the plows travel toward the center of the machine, seven of the plows on each side being in the ground at the same time. The width of the land covered at one passage of the machine is approximately 40 feet.

When turning at the end of a field the two plow arms can be raised so that the plow shares and the disks are clear of the ground, and the machine can be turned in its own length by means of the steering wheel and the catterpillar tractors. When desired, a start can be made from the very end of a field, as the tractor can be backed up to a fence, if necessary. The machine, however, is intended mostly for plowing where large tracts of land are under cultivation.

The machine has an approximate weight of eight tons, and under tests on land that had been plowed in three or four years it covered about 32 acres in a day of 10 hours.

New Uses for a Rare Element.

New and interesting uses for rare elements or metals seem to be demonstrated constantly. "Selenium" is not a familiar metal, but is a by-product in the electrolytic refining of copper. Demand for it has been very light and its chief use has been in the glass industry, in photographic chemistry and in medicine. It has also been used to a limited extent in electrical work, because it possesses the peculiar property of varying conductivity according to the intensity of the light. Under the influence of the light its conductivity may be 500 times greater than in the dark.

As the result of extensive research work carried out at the University of Wisconsin a new property has been discovered which should open up a big field for the application of selenium and incidentally make it worth while for copper refiners to pay more attention to its recovery. In the form of selenium oxychloride it acts as a powerful solvent on certain organic substances. The unsaturated hydro-carbons, such as acetylene, benzene and toluene dissolve readily, while the paraffin hydro-carbons, such as gasoline, vaseline and paraffin wax, are unaffected. Pure rubber, vulcanized rubber, asphalt, bitumen, and the casein glue used in airplane construction dissolve easily in selenium oxychloride, and it can be used in coal analyses to extract the bituminous material in soft coals.

Alfred T. Marks.

NOTES.

The following Note has been issued by the [M]adras Publicity Bureau:—The Govern[m]ent have approved the proposal of the [C]hief Conservator of Forests to establish a [S]aw Mill at Russelkonda in the Ganjam [D]istrict to deal with timber extracted from [th]e Government forests in the locality. The [d]etailed management of the working of the [m]ill and the marketing of the produce will be [e]ntrusted to Messrs. Parry & Company in [a]ccordance with the terms of a five year [a]greement which is terminable on six months [n]otice by either party. The general policy [o]f the undertaking will be controlled by a joint board consisting of 2 members nominated by Messrs. Parry & Company and 3 representatives nominated by the Government who will be for the present (1) the Chief Conservator of Forests, (2) the Forest Utilization Officer, and (3) the Conservator of Forests, Northern Circle. Experience has shown that the forest resources of Ganjam can only be fully utilised if mechanical sawing is substituted for the slow and wasteful process of hand sawing. The mixed lot of forest timbers available do not command any ready sale at remunerative prices when dealt with by the customary rough and wasteful methods. The success of a steam saw-mill in converting the various sorts and sizes of timber to hand into a marketable product will depend almost entirely on the proper use of up-to-date and elaborate machinery which can be operated only by experts in saw-mill practice. It was for this reason that the Forest Department decided to invite the co-operation of Messrs. Parry & Company as this firm has the largest saw-mill experience in South India and possesses in the person of Mr. Brace Brooks one of the first experts in India in milling and marketing timber. Mr. Brace Brooks is now engaged in studying the latest saw-mill practice in America and Europe where there have been great developments in the timber industry since the war. He is to purchase the machinery required for the Russelkonda mill. It is expected that the mill will meet some part of the present very large and unsatisfied demand in the North of the Presidency for timber sawn to definite dimensions and effectivly seasoned. It is also hoped that private enterprise may be induced to consider seriously the possibility of setting up similar plants in other parts of the Presidency if the use of a well equipped and modern saw-mill proves a commercial success in Ganjam.

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It has long been known that American and German steel makers were anxious to find some openings by which it would be possible for them to work not exactly in co-operation, but at any rate in close co-ordination, and it is now over a year since the U. S. Steel Trades combine made their first overtures to German iron and steel masters. Something very like a steel combine has now been formed, in which not only U.S. and German, but also French firms are represented. The only conspicuous absentees are the British steel makers; and whilst they are to be congratulated on their sturdy independence, it is evident that more than mere admiration of their attitude will have to be forthcoming if we are to help them face the fierce competition they will have to meet. Some time ago, under the old International Steel Rail arrangement between the producers in various countries our trade received a setback from which it was exceedingly difficult to recover in spite of the superior quality of our productions, the vast size of our Colonial and Indian markets, the tremendous amount of capital we had invested in foreign undertakings, and other advantages. At present we are suffering from a shortage of rail mills, and it would seem that at any cost that deficiency must be ovecome. The far-sightedness of our steel firms in keeping aloof from the new International Combine is to be

commended, and their efforts should be assisted in every way possible by all interested in British trade development. From every point of view our people are likely to do better fighting than assisting the combine, and British industry should certainly be the gainer by this attitude of sturdy independence.

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The Spruce Falls Company, Limited, Canada has acquired 23,727 acres of pulpwood limits in Northern Ontario, 1,740 square miles, 400 acres of a colony farm occupied by a aliens interned during the war, at Kapuskasing and water-power rights on the Kapuskasing, River. The company has authorised capital of 7,000,000 dols., and its purchases of equipment, etc., are likely to be made largely in the United States and Canada, although through the efforts of H.M. Trade Commissioner's Office at Toronto, United Kingdom makers of pulp and paper machinery have had an opportunity of submitting quotations and particulars to the legal representatives in Toronto of the Spruce Falls Company.

The Premier of Ontario has announced that in future in all contracts for the sale of pulpwood limits a clause will be inserted guaranteeing 15 per cent of the ontput to Canadian newspaper publishers.

According to the Canadian Pulp and Paper Association, the pulp and paper exports from Canada for April reached a total value of 8,172,356 dols, as compared with 4,968,939 dols. for April, 1919, an increase of 3,203,417 dols. They were made up as follows :—

Month of April.	1919. Dols.	1920. Dols.
Paper and manufacturers of	3,630,238	4,729,354
Chemical pulp... ...	1,120,990	2,936,633
Mechanical pulp ...	217,711	506,369
Total ...	4,968,939	8,172,356

Newsprint formed the principal item of the paper exports for the month. There was, however, a falling off in quantity at 899,324 cwt., although an increase in value at 3,827,541 dols., as compared with 920,592 cwt., valued at 3,160,318 dols., in April, 1919.

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Lack of pasturage for dairy cattle in the vicinity of Nitro, West Virginia, resulted in the establishment at that war-built city of a "machanical dairy," where milk and cream equivalent to the output of a farm with 1,500 milk cows, were produced, according to a Government report recently published. Bottles and cans of the fluid were labelled "reconstructed" milk or cream and "nitroleo." Accommodation for 25,000 inhabitants had been provided at Nitro—schools, churches, hospitals, department stores, restaurants and all other elements of a modern well equipped community being part of the project. As a construction problem it was comparatively simple, but officials began to meet with obstacles as soon as they approached the task of ensuring a supply of staple foodstuffs, particularly of fresh milk. Nitro is situated in a mountainous district where little, if any, natural pasturage is available. Local milk supplies were barely sufficient to satisfy the normal demands of Charlestown, the nearest metropolis. Expansion of the natural supply being out of the question, the public health service was asked for aid, and the first "mechanical dairy" resulted. The process used is described as the "emulsification of butter fat obtained from unsalted butter in a solution of skimmed milk powder or diluted evaporated milk." A building, 150 feet long by 51 feet wide was constructed and provided with huge mixing vats, refrigerators and bottling apparatus. Chemically pure water was used in the mixing and careful tests were made of the product, which proved to be a little superior, if anything, to natural milk.

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In Japan a new fibre has been coming into use, known as "sugamo," a kind of sea grass which, when properly treated and mixed with raw cotton, makes a yarn strong and useful for cheapening the manufacture of cotton

fabric, the price of which, it is said, is now very high. It is hoped that if the new material could be brought into general use for the cheaper makes of cotton the price of clothing for the poor will be reduced. This sea grass grows plentifully along the shores of Japan the quantity indeed being unlimited. It is harvested usually in the autumn months. Its utilization for mixing with raw cotton has only just begun, so that developments are problematical. The main difficulty has been to invent successful means of removing the tough outer skin of the plant so as to set free the fibre; but improvements in the process are very promising. The plant has to be boiled in lye and then rinsed repeatedly in water until all the hard outer skin is removed when the fibre left is not unlike cotton. The work of preparing the fibre forms a profitable occupation. It is said that cotton mixed with this sea fibre is stronger and more durable than unmixed cotton, tests on sea nets made from it having proved very satisfactory. It also takes dye well and has rather a pleasing gloss when finished. A company has recently been formed in Japan for exploitation of the new enterprise, and great developments are expected. Mixed with pulp it improves the quality of the paper turned out, and it may also be usefully employed in other important industry.

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The following Press Communique of the Government of India, Public works Department (Establishment), dated Simla, the 1st November 1920, is republished :—The Government of India have learnt from the Secretary of State that during the present year there has been a large influx of Indian students to Great Britain, desiring to pursue courses of instruction and training in Engineering without having acquired preliminary education in India sufficient to enable them to enter upon Engineering studies in that country with profit to themselves. Apart from the fact that Engineering Colleges and Engineering Faculties in England are at present overcrowded, these students are exposed to disappointment by being unable to obtain admission on account of their previous inadequate training, no Engineering College or University in Great Britain being willing to admit an Indian student of Engineering on the ground that he has passed the matriculation or Entrance Examination of an Indian University. The Government of India, therefore, desire to warn all students intending to proceed to Great Britain who are desirous of pursuing courses of instruction in Engineering, that they are acting to their own disadvantage if they leave Indian University or, better still the B.Sc. or the B.Eng., and that, in order to avoid disappointment, they should, before leaving this country, invariably consult and act on the advice of one of the Students' Advisory Committees which have been formed at Madras, Bombay, Calcutta, Dacca, Allahabad, Lahore, Patna, Nagpur, Gauhati, and Delhi.

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Thrift is not a hard practicality alone; there may be rich romance in it, says the *Canadian Textile Journal.* Rubbish, waste, useless stuff that men threw away and paid to have carted off to the dump was the basis of one of the greatest fortunes in England and the stepping stone to a peerage. An Englishman who died the other day had a career which was one of the most remarkable romances the world of invention and manufacture has ever known. As a young man he was a spinner in Yorkshire, had mastered his trade and owned some mills. One day, when in London, he came across a heap of silk waste mixed up with dirty rope ends, leaves and sticks, all knotted together. "What is that?" he asked. "Oh, simply rubbish. It is impossible to do anything with it," was the reply. But the trained young spinner of Yorkshire knew better. He bought the great heap of waste at a half penny a pound and was laughed at. For nearly ten years all the profit from his mills went into experimental machinery for the utilization of this

waste. Then came the startling announcement that he had produced a machine which, at small cost, turned the waste rubbish into beautiful fabrics. The result is that to-day waste silk pours into the great Manningham mills from all parts of the world, to come forth worth hundreds of thousands of pounds.

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The National Aniline and Chemical Company is rapidly adding to its line of colors urgently needed by the textile trade, says *Textiles*. Among the most recent additions is Superchrome Garnet Y, which is a chrome dyestuff notable for its level dyeing as well as its fastness qualities, and is an adequate substitute for the pre-war Acid Alizarine Grenade R of Hoechst. It can be applied by the top, meta or bottom chrome methods, although the top chrome method gives the best results from the point of view of fastness. It is especially recommended where the fabric requirements call for exceptional fastness to decatizing, fulling, light, potting, and washing in the production of browns, Bordeaux and mode shades on woollens and worsteds. It can also be employed for vigoreaux printing with chromium fluoride, acetate of chrome or chromium salts. Another very desirable addition is Fast Crimson G. R, a level dyeing Acid Red, corresponding to the pre-war types Amido Napthol Red G. and Azo Phloxin 2G. This color is unusually fast to light and will leave cotton and silk effects unstained. One of the new browns added is Alizarol Brown 2 R, which is a chrome color matching the pre-war types Acid Alizarol Brown B, Palatine Chrome Brown W and Anthracyl Chrome Brown D. This is a top chrome dye possessing good fastness to fulling, carbonizing and light, and is especially suitable for light fancy shades on high-class woollens and worsteds.

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The following note has been received from the Secretary, Sugar Bureau.—In South Africa pioneer work has been done in the production of motor fuel known as natalite by distillation of the molasses from the sugarcane. It is by no means a perfect fuel for internal combustion engines and the difficulty so far has been to discover a powerful denaturant that is both cheap and plentiful. In 1919 the Advisory Board of Industry and Science recommended that the manufacturers of natalite should be given permission to manufacturers a certain quantity of the spirit, using one per cent of pyridine as a substitute for the costly wood naptha then used. But this recommendation was not accepted. It is now reported from South Africa that in recent months a new denaturant has been found in a petroleum product known as simonsen and that the authorities have permitted its use in the place of wood naptha. It is stated that this product is very efficacious and its presence with pyridine in industrial alcohol fully meets the desired end. In view of the urgent need for the production in large quantities of cheap motor spirit, this discovery is of considerable interest.

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The Government of India decided in May last to establish a Labour Bureau under the Board of Industries and Munitions, and the Bureau has now been in existence for some months. Mr. A. G. Clow, I.C.S., is Controller of the Bureau and Miss G. M. Broughton, O.B.E., I.E.S., who has returned from work in the Welfare Department of the Ministry of Munitions and was connected with the Industrial Fatigue Research Board in England, has been appointed Lady Adviser. The main functions of the Bureau will be the collection and collation of all information bearing on labour in India. It will maintain contact with the International Labour Office at Geneva and with similar institutions abroad, and should as it develops serve as a centre of reference for all interested in Labour questions and for officers of Government and private persons who have to deal with industrial labour. The Lady Adviser will by touring throughout India collect

information bearing on women's and children's labour and her advice and help will be at the disposal of all who care to avail themselves of it.

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As cotton is grown over large areas in India what the "Popular Science Monthly" says of a new use of cotton stalks ought to enable Indian capitalists to make money. It says:—"There is now a pulp-mill in Greenwood, Mississippi, that turns one hundred and fifty tons of cotton stalk into fifty tons of valuable paper pulp every day. A careful study of the cotton plant has led to the discovery that a certain thin tubular fibre in the plant will make excellent cellulose for durable papers. It is strong and flexible. If a quarter of the annual supply of the cotton stalks of the South were put to this use each year there would be no need of a paper shortage in this country." The same journal tells its readers that the bark of eucalyptus trees can be used for making twine, rope, and bagging. The bark is first passed through a softening machine which loosens the fibres. Next it is put through carding and spinning machines. The resulting twine is strong, durable, and does not cost much to manufacture. The supply of bark is practically unlimited and can be easily gathered and sent to the factory. The eucalyptus tree grows in India, too.

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In connection with the establishment of a sericulture farm at Kalimpong it is understood that this place was selected last year by Mr. Evans, Director of Agriculture, Bengal, and Mr. Jameson, Imperial Protozoologist. Besides the land set apart for the cultivation of the mulberry two plots have been acquired for a laboratory. Sericulture was first started at Kalimpong over six years ago in connection with nature study in the classes of the local Training School and the operations have all along been directed by Mr. P. C. Chaudhuri, Superintendent of Bengal The silk worm that has proved suitable for this place is the multivoltine species which is also largely reared in Japan and other countries because of the larger yield of silk that it gives in comparison with the other species. Kalimpong has proved better suited for sericulture than Shillong, because of its colder climate in the winter and its proximity to railway communication.

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Mr. L. G. Killby has been appointed Secretary to the Empire Cotton Growing Committee. He is at present Superintendent of the Department of Technology, City and Guilds of London Institute. In 1904, at Oxford, he took his B.A. degree in the Honours School of Natural Science, with First-Class Honours in Chemistry. He then became Demonstrator in Chemistry, and in 1907 was awarded the degree of B.Sc. (Oxon) for research work. He has been on the staff of the Department of Technology for 14 years. During the war Mr. Killby received a Commission in the Army, and served in France as one of the chemists on water supplies in the field, and was afterwards transferred to the Chemical Warfare Department of the Ministry of Munitions. He was mentioned in despatches.

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The enormous sales of machinery and stores of all sorts at the munitions works in England offer unusual opportunities to Indian dealers and users of machine tools of all sorts. Some recent issues of the *Machinery Market* contain as many as six pages of advertisements of sales by auction of every description of machine tool for working in wood and metals hydraulic plant, contractor's plant, electric plant, lifting and hoisting plant, gas producers, prime movers, appliances for heat treatment, grinding machinery, drawing and piercing presses, telephone installations testing machines, power hammers, shearing and sheet metal working machinery and other appliances, many of which have done very little service. At a time when new machine are so difficult to obtain without long period of waiting, this occasion should be welcom to many manufacturers who are in need c renewals or extensions of plant.

GLEANINGS.

The grand total of gross Indian sea and land customs revenue (excluding salt revenue) collected during the six months, April to September, 1920, amounted to Rs. 1,530 lakhs, as compared with Rs. 885 lakhs in the corresponding period of last year. Import duties contributed Rs. 1,099 lakhs; export duties Rs. 238 lakhs; excise duties on cotton manufactures Rs. 138 lakhs; and on motor spirit Rs. 26 lakhs; and land customs and miscellaneous Rs. 29 lakhs. Cotton manufactures, metals and hardware, liquors and tobacco were mainly responsible for the increase.

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Chinese methods of producing silks are so primitive that it will be a long time before China can offer satisfactory material to the American market, writes Mr. D. E. Douty, one of the American party who visited China to investigate the silk industry. The American silk dealers have often called the attention of the Chinese authorities to the importance of improving their silk industry, but the latter could never afford to listen to any suggestions on the subject. It is a matter of regret, says Mr. Douty, that China should remain in such a condition of industrial torpor at this time, when there is a growing international demand for silk.

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Apropos of a paper mill for Mysore, others are doing while we are talking. Southern Saskatchewan is being surveyed with a view to securing the most suitable scope for a million dollar paper mill. Wheat straw is the material proposed to be utilised in the manufacture of paper. Experiments, it is said, have shown that two tons of straw can be made into a ton of paper, while two tons of coal are necessary for the power, making, it is stated, the manufactured product much cheaper than the price now charged for the pulp-wood product.

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The Madras Government have granted Messrs. Tata Sons, Limited, Bombay, a concession of the right to make use of the water in the Kurdah river and its tributaries on the Nilgiris for the purpose of generating power for supplying electrical energy to

Ootacamund, Coonoor, Coimbatore and to the Cantonment of Wellington. The granttees of the concession have undertaken to pay to the Government of Madras within 2½ years a sum of Rupees 6 lakhs to be used for the Coimbatore water works and for no other purpose.

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By the decision of an extraordinary meeting of shareholders, the firm of Messrs. Brunner, Mord and Company, Limited, is to devote £100,000 to the encouragement of scientific education and research. The resolution authorises the directors to distribute the sum to such universities or other scientific institutions in the United Kingdom as they may select for the furtherance of scientific education and research.

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Experiments are being conducted at the Textile Institute at Leeds, England, in manufacturing, by a chemical process, artificial wool from cellulose derived from cotton waste. These efforts are said to have been very successful, and although the product is only a substitute for wool, it is said to have great wearing possibilities, especially if used with other fabrics.

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On August 10, the Canadian Wheat Board made an initial distribution of over $25,000,000 on account of participation certificates. These represent the difference between the fixed sum per bushel already advanced to farmers and the actual sum obtained after marketing operations have been completed. A further distribution will be made shortly.

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During the first four months of 1920, 564 new industrial concerns came into existence in British Columbia, establishing a record for any similar period in the history of the Province. His Majesty's Trade Commissioner in Winnipeg says that the present year will be one of the heaviest in industrial development the Province has ever known.

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The Madras Government have sanctioned the proposal of the Registrar of Co-operative Societies to raise the maximum rate of interest to be charged on current accounts in Co-operative Credit Societies from 2½ to 3 percent per annum. This order will be

much appreciated by co-operators in view of the decreased value of money.

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The Federation of British Industries Commissioner in East Africa reports that the Government flax grader who recently arrived from Ireland is very pleased with the appearance of the flax produced in the Kenya Colony, and states that it compares very favourably with that grown in other countries.

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During the first six months of the current year South Africa's imports were valued at £48,000,000, against £28,250,000 in the first half of 1919. Exports were valued at £51,000,000, compared with £58,250,000. It will be observed that the favourable balance has declined from £30,000,000 to £3,000,000.

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A Hamburg scientist named Plouson, says the *Daily Express*, proposes to obtain a cheap supply of energy from the air by sending up metal balloons to collect electricity; he hopes to supply all Germany with electric power. He will use extra-high (pressure) overhead mains to enable the electricity to step down.

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Losovski, the leader of the Bolshevist Trade Commission at present in Germany, has stated that the close co-operation of German and Russian trade unions is urgently necessary, and that Soviet Russia specially requires technical men for machine construction, electro-technics, and agriculture.

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In order to attract tourists to British Honduras a motion is to be introduced in the Legislative Council that the Government should offer for 75 years at a "peppercorn" rent a site at Belize for the erection of a hotel within the next 12 months on plans to be approved by the Governor-in-Council.

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Timely measures have been taken in Palestine to prevent the country from being disfigured by unsightly advertisements, and [illegible] hoardings in any place except the actual premises in which the business is carried on has been prohibited.

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An Extraordinary International Trade Union Congress is to meet in Brussels on November 23 to deal with the International distribution of coal and raw material, the work of the League of Nations for the reconstruction of Europe being considered too slow.

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According to the *Monthly Commercial Letter* issued by the Canadian Bank of Commerce at Toronto in August, manufacturers in many centres report improved efficiency on the part of labour, indicating a trend in the direction of more normal conditions.

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The situation in the flax industry in Belgium is growing more critical, and the cessation of orders due to the falling tendency in prices had led to the closing of the greater part of the works. There is no prospect of an improvement in the situation.

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Sites for the erection of oil tanks at Melbourne, Sydney, and Freemantle, have been purchased, and as soon as the work is completed, the principal steamship lines trading with Australia will use oil fuel instead of coal.

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Brazilian coal is declared by a New Yorl expert to be of the finest quality, examina tion showing each ton to contain 30 per cen stone, 8 per cent ash, 10 per cent volatil substances, 201 pints of oil, 22lb. of sulphat of ammonia, and 110 lb. of iron pyrites.

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A French Scientist attests that he ha devised means of identifying timber by tl varions reactions on colouring matter it co tains and that the idea can be extended so to prevent deception in imported woods.

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Owing to the present gloomy conditio in regard to cereal stocks in Germany, s

the President of the Imperial Grain Department, it is intended to import 2 000,000 tons of breadstuffs, chiefly from America.

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It is officially estimated that this year's Canadian wheat crop will reach 298,000,000 bushels—an increase of 105,000,000 over the 1919 crop. The oat crop, it is thought, will amount to 556,000,000 bushels.

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Sir Alexander Magnire, chairman of a British amalgamation, announces that British match manufacturers will invest £1,000,000 in an extensive plant in the Province of Quebec.

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Japanese foreign and home officials are said to be considering a plan to direct Japanese emigration to Brazil in view of the barriers raised in Canada, the United States, and Australasia.

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A Swedish Government Commission has reported in favour of the introduction of prohibition if the approval of 60 per cent of the voters is obtained in a referendum.

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New South Wales Government dockyards at Walsh Island have contracted to build for the Sydney Ferries, Limited, two harbour steamers at a cost of £110,000.

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A Bill to substitute a simple majority for the three-fifths vote required to enforce prohibition in Victoria was defeated by 34 votes to 24.

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Moscow states that in the Smolensk Government 180,000 men and 190,000 horses have been registered with a view to labour conscription.

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Two new fuel oil storage tanks, of 8,000 tons capacity each, are in cource of erection at Perim and Aden, and will be completed within the next six months.

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Japan is building a number of submarines, and, pending the construction of a special building, the subsubmarine school is using the battleship *Shikishima.*

Ontario will be able to absorb 50,000 farm workers next spring, and there is a demand for settlers both with and without capital.

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Tirol peasants at Innsbruck have resolved that only immediate union with Germany can save Austria from collapse.

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Northern Ontario has, during the last 10 years, produced £16,000,000 approximately worth of gold.

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Japanese and Chinese companies with substantial capital are encouraging sheep and cattle rearing in the Mongolian prairies.

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The United States received 992,850 lb. of the citronella oil exported from Ceylon in in 1919, compared with 407,351 lb. in 1918.

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Canada's production of condensed milk increased from 15,000,000 lb. in 1910 to 110,000,000 lb. in 1919.

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£4,440,000 in Ontaria and 3,478,000 in Quebec is to be spent on the improvement of roads and highways.

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The Barbados Legislature is being asked to vote £50,000 for railway improvements.

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It is announced that the Japanese are busily developing the Sakhalin oilfields.

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Czecho-Slovakia has concluded a commercial agreement with Bulgaria.

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New South Wales has 33,465,584 sheep, 2,852,046 cattle, and 577,183 horses.

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Canada's total elevator capacity is now 226,000,000 bushels.

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There are 3 per cent saw mills in operation on the Pacific Coast of Canada.

ECONOMIC NOTES.

INDUSTRIES AND COMMERCE.

Progress in the United Provinces.

The following Resolution of the Local Government on the Report of the Director of Industries, United Provinces, for 1919-20 is published in the *United Provinces Gazette* of 16th October, 1920:—

The report of the Director of Industries for the year 1919-20 reflects the influence of post-war conditions on industry. Development has been retarded by the difficulty of obtaining machinery and the restriction of the coal-supply occasioned by the shortage of wagons. Owing to labour troubles in England and the unsettled state of Europe, competition has not yet begun to make itself effectively felt, but the cessation of demands for the Army has restricted the market for goods of local manufacture. Capital is no longer shy of industrial investments, although its flow is in the main directed to the more advanced industrial centres. The glut of supplies in Europe and America has temporarily reduced the export of hides and reduced the price of this commodity almost to the pre-war level. Indigenous woollen goods still find a remunerative market owing principally to the high price of imported goods and up-to-date cotton mills have had more orders than they could deal with.

The glass industry continued to make headway. The Western India Prospecting Syndicate is constructing a factory near Firozabad, where it is proposed to manufacture sheet-glass as well as bottles and bangles. The need of the moment, however, is the introduction of more up-to-date furnaces and methods of manufacture. There is a plentiful supply of raw material and the results achieved by chemical research with *reh* justify the expectation that the sources of supply may be increased. But the call for initiative in this trade is urgent as foreign competition is beginning to assert itself as may be gathered from the figures of import for the year which have increased by Rs. 75,20,000. Government is obtaining the services of a glass expert to advise industrialists both in the matter of machinery and processes of manufacture: he is expected to arrive this autumn.

The future of the oil industry continues to be full of promise. The demand for oils as a substitute for fat in the manufacture of soap is growing. Experiments made by the Industrial Chemist to Government show that when mixed in the right proportion with other ingredients *neem* oil loses its strong odour and can be solidified. The raw material for the manufacture of this oil is plentiful and there is therefore a prospect of a new, cheap, and useful ingredient in the manufacture of soap being placed on the market. Other experiments conducted in the laboratory of the Industrial Chemist would seem to indicate the possibility of cotton and being utilized as a suitable base for the manufacture of vegetable butter. The growing scarcity of *ghee* is likely to increase the demand for, and popularize the consumption of, substitutes, the use of which is not open to objection on religious grounds; purely vegetable preparations probably fulfil this condition. The manufacture of casein also from cotton seed on a commercial scale would seem to deserve the attention of industrialists.

The essential oils industry of which Kanauj is the stronghold also enjoyed a prosperous year. Some time ago Government sanctioned an annual grant of Rs. 5,500 for three years to carry out experiments with a view to improve the indigenous processes of manufacture and this assistance has been of substantial help to the industry. An improved type of still has been introduced and experiments have been carried out in the distillation of roses. The results achieved were only fairly satisfactory, and the Industrial Chemist is of opinion that a higher percentage of the essence cannot be obtained without some improvement in the flower itself. Experiments were also carried out with clove-stems and these show that with an improved type of still the stems can yield on an average an outturn of 4½ per cent, the oil on analysis revealing a high eugenol content. These results would seem to justify the conclusion that although clove-stems are not an indigenous product their distillation could be undertaken in India if a cheap supply of the raw material from Africa or elsewhere could be organized.

During the war the hand-weaving industry received a strong stimulus from the difficulty met in obtaining manufactured articles from abroad. But with the resuscitation of foreign competition special efforts will have to be made for this industry to maintain its position in the market. The efforts of the Central Weaving Institute, Benares, and the other local weaving schools, fixed or peripatetic, have helped to popularize the fly-shuttle loom among weavers and the organization of depots on a co-operative basis for the supply of yarn and machinery should help to stabilize this cottage industry.

Mr. Heard's deputation to England early in 192 to participate in the British Industries Fair in London has had excellent results. The success of the Indian section at this exhibition was reported as entirely due to the articles sent from this province and orders for

more than £1,000 in value were registered. Textiles could not be exhibited at the Crystal Palace Fair, but an application is being made this year to secure space at Glasgow for the exhibition of this class of goods also. It is believed that regular participation in this fair should help to establish a regular business connection with England and to popularize the art-wares of the province in Europe. The principal difficulty would seem to lie in the organization of the local market for the supply of goods up to sample in large quantities. This is the function of private enterprise, but the Principal of the School is giving all possible assistance. With an effective organization the future of this nascent trade with Europe should be assured.

The Technical Schools at Lucknow and Gorakhpur had a satisfactory year. There were 157 students undergoing training in the former and 178 in the latter including men attending night classes. Most of the successful students after completing their course are apprenticed with the railway workshops, while others find remunerative employment outside without difficulty. The Technical School at Jhansi, which was only recently established, has 59 students on the rolls. The Carpentry School, Allahabad, is rapidly developing as may be gathered from the following figures of enrolement :—

30th June, 1919	54
31st March, 1920	72

The training imparted at this institution is in great demand and should in course of time help to establish a prosperous trade in furniture and other woodwork in Allahabad.

Arrangements are already in train for a very considerable expansion of this institution.

The School of Printing and Dying at Cawnpore continues to attract students from all parts of India. A Printing School is also being temporarily established at Farrukhabad to train printers, the number of whom has diminished during the war owing to the older artisans having sought other employment during the period of trade depression. The organization of peripatetic instruction in dyeing is also under consideration. There were 115 students undergoing training at the School of Arts and Crafts, Lucknow. There is no lack of applicants for admission, but difficulty is experienced in inducing students to complete their course, as ordinarily a good many of them leave the institution in response to offers of employment, the demand for such craftsmen being very great.

Mr. Ormerod, the Principal of the Weaving Institute, Benares, was placed on special duty in December, 1919, to investigate the possibilities of peripatetic weaving schools and to suggest method of widening the scope of their activities. His report has been received and is under the consideration of Government.

The weaving schools, both fixed and mobile, seem to have established their utility both as sources of instruction and as depots for the supply of improved apparatus. There are now 150 weavers working with fly-shuttle looms in Shahjahanpur, 225 in Moradabad, 90 in Etawah, and 1,500 in Mau.

There were 45 students in the Leather Working School, Cawnpore, on the 31st March, 1920. A branch school has also been established at Meerut and is at present under the administrative control of the Principal of the Cawnpore School.

Reference has already been made to the results of the more important experiments carried out in the laboratory of the Industrial Chemist at Cawnpore. By the appointment of Dr. Watson, a distinguished chemist, as the first Principal of the Research Institute, an important step has also been taken towards the realization of a scheme which the War had postponed. The Government Architect is preparing plans for the buildings and material is also being collected by the Public Works Department to start construction as soon as the plans are ready. It is hoped that this institute will be ready before long to play its part in the industrial development of the province. The question of adding a teaching side to it will be examined by the Committee which the Government is appointing for the purpose.

Sir Harcourt Butler desires to thank the Board of Industries for its valuable assistance in connection with the schemes which were submitted to it for advice. The Board is Government's principal adviser in all matters of industrial policy and with the expansion of the activities of the department its utility is destined to grow. His Honour also greatly appreciates the services of the Director, Mr. O'Malley, and his lieutenants.

FINANCE.

Economic Effects of the War.

Dr. J. H. Clapham of Cambridge, who addressed the Economic Section of the British Association on the economic consequences of the war, said it was as yet too early to work out a parallel between the commercial and industrial slump which followed previous wars and the slump that followed the Great War of 1914-18, for we had not yet had it.

"But," said Dr. Clapham, "it is coming. More certainly, I am inclined to believe, in the United States than in England; but pretty certainly here also. I say more certainly in the United States because her position bears most resemblance to that of England in 1815-17. Consider that position. What before the war was, on the balance, a debtor country has become a creditor country. That creditor is equipped to export both raw materials and manufactures—iron and steel goods particularly—on a huge scale. It is true she is a heavy importer of some foods, such as sugar, coffee and tea, and of certain raw materials, such as rubber, timber and wool. But owing to her tariff system and her general policy, she is reluctant to take many things which her debtors have to offer. Her recent 'dry' policy for example, has shut her markets to one of France's most valuable exports, an export with which France has always been in the habit of paying her creditors.

"Already, I notice, American business men are beginning to point out what English business men stated clearly in a famous document, the Petition of the London Merchants, a century ago—that the country which will not buy neither shall it sell. This was the most solid of all Free Trade arguments in the early nineteenth century, and it has lost none of its force. No doubt America is, and will be, glad to take part payment in gold, just as England was in 1814-16. But that is not a permanent solution. If she remains a creditor nation—and there is no present reason to think that she will not—she must in time arrange to take more goods from outside. Her political processes, however, are slow; and it seems unlikely that she will have adjusted her policy before the post-war slump is upon her.

OUR BETTER POSITION.

"The United Kingdom, which, on the whole, still takes freely what its customers have to offer it, is in a better position, provided its customers can go on offering. This may prove an important proviso. Customers who have been little hurt or even helped by the war—Spain, perhaps, or Egypt, or India, or New Zealand—should continue good buyers. But the uncertainty gives cause for anxious thought in the case of the war-damaged nations, Allied and ex-enemy. Modern financial and commercial organization has postponed the critical moment in a way that was impossible a century ago.

"Every kind of financial device—long private credit, assistance from banks, credits given by Governments—has been called in, so that trade may be resumed before the war-damaged nations are in a position to pay for what they need by exporting the produce of their own labour. The more industrial the damaged nation is, the more complex is the restarting of her economic activity. Corn grows in nine months, and pigs breed fast. The start once given, countries like Denmark and Serbia, both of which are normally great exporters of pigs or bacon, could soon pay for necessary imports of machinery or fertilisers bought on long credit to restart their rural industries. The United Kingdom, the least damaged of all the combatants except America, is believed by the Chancellor of the Exchequer to be now rather more than paying its way. That may be sanguine, but at the worst our accounts are nearly balanced. What might not have happened in 1919 if modern methods for postponing payment had not been applied internationally?

"The other chief combatants are far from paying their way. Italy is importing abnormal quantities of food and also her necessary raw materials with the aid of American and English credits, while Germany, who can get little in the way of credit, has hardly begun even to import the raw materials to make the goods by the export of which she may eventually pay her way, not to mention her indemnities.

THE CENTRAL PROBLEM.

"The central problem is one which I can only indicate here, not discuss. Its discussion is for experts with full inside knowledge from month to month, and the answer varies for every country. It is—when will the inability of the war damaged nations to pay for all that they want, in food and materials, in order to restart full economic activity, make itself felt by the nations who are supplying them, primarily, that is, the United States and ourselves? In 1814-16, when the problem was of course infinitely smaller because nations were so much more self-sufficing, the reaction came at once for lack of long organized credits. Conceivably, all other combatants might do in turn what we seem to have done—that is, adjust their trade balance within a reasonable period and so avoid renewal of special credits. In that case the post-war trade slump would come, not as an international crisis, but as a gradual

decline, when the first abnormal demand for goods of all kinds to replenish stocks is over. Already this ype of demand is slackening in certain quarters. We shall do very well if we have nothing worse than that gradual decline, which would be eased, in our case by our extensive connections with undamaged countries and by our willingness to buy most things which any nation has to offer. The situation would be still further eased if countries such as Germany and Russia were to develop in turn what might be called a reconstruction demand, to take the place of the satisfied reconstruction demands of our allies. But the fear, as I think the quite reasonable fear, expressed in some well-informed quarters, is that, in view of the complicated and dangerous currency position in many countries; in view of the difficulty which the war damaged nations have in collecting taxes enough to meet their obligations; in view of the slowness with which some of them are raising production to the level of consumption; in view of the complete uncertainty of the political and economic future in much of Central and Eastern Europe—that in view of these things, and quite apart from possible political disturbances, we shall have to go through a genuine crisis, as distinct from a depression; a crisis beginning in the field of finance, when some international obligation cannot be met or some international credit cannot be renewed, spreading to industry and giving us a bad spell of unemployment, comparable with the unemployment of the post-war period a century ago, and more dangerous because of the high standard of living to which the people in this and some other countries is becoming accustomed.

CO-OPERATION.

Bombay Provincial Co-operative Conference.

The Director of Information, Bombay, writes:—Special importance attaches to the Report of the last Bombay Provincial Co-operative Conference, for two reasons. It was the last Conference organized by the Registrar. The Central Institute will take over the management from next year and it was the first Conference that has been held on an elective basis. Again the arrangement of the business at the Conference showed a distinct departure from the practice hitherto followed. Instead of calling for a number of papers from several delegates, the Registrar this year assigned to seven sub-committees, some problems of practical importance in the movement.

The Report opens with the inaugural address of His Excellency the Governor, in which His Excellency gave a deeply interesting review of the progress of the movement during the last year, and examined the lines of future advance. Then follows the speech of the Registrar, in which he gave a summary of the action taken upon the resolutions of the last conference, and added some illuminating comment upon the situation of the Co-operative Movement. He concluded by expressing the belief shared by all the delegates that by Co-operative Movement at the moment. He concluded by expressing the belief shared by all the delegates that by co-operation in the improvement of economic conditions, by providing easy and reliable credit, by stimulating industry, by securing adequate and sanitary housing, and, in a word, by supplying the fundamental amenities and facilities of modern human life, they were contributing materially to the true progress of the community, and stimulating a steady and significant growth in public morality, prosperity and idealism.

Among the questions discussed by the several sub-committees, the most important were the formation of a Co-operative Board,—mainly elected but partly nominated, to work with the Registrar; the introduction of cheques and discounting facilities; the need of a Producers' Bank; the reconstruction of the Consumers' Wholesale Society; the financing of Cotton Sale Societies; the constitution and functions of Co-operative factories, and the Co-operative Sale of Agricultural Produce.

Rules of procedure for the conduct of the business of the Conference were also considered by a Sub-Committee, and adopted at the Conference. It was recommended that a Committee of five persons, representing the Central Banks and the Co-operative Institute, and including the Assistant Registrars, should be appointed to make definite recommendations for the purpose of establishing a service of trained managers. It was resolved at the Conference that Agricultural Credit Societies, and Agricultural non-Credit and Weavers' Societies, in their early stages of development should enjoy free audit. The scale of audit fees for other kinds of Societies was also laid down.

The Report contains a number of very informing and practical notes by some of the most prominent non-official workers in the Co-operative field, and the highest officers in the Co-operative Department. It

also contains a report of the discussion in the Conference on the various recommendations of the Sub-Committees, in which many prominent Co-operators took part. It is thus a very readable and instructive document and should be read, not only by every Co-operator and every student of Indian economics, but by very many other intelligent people who will learn from it something of the great potentialities of progress for this Presidency, which exist in the Co-operative Movement.

CORRESPONDENCE.

To

The Editor,

Mysore Economic Journal, Bangalore.

A Greeting From St. Dunstan's.

Sir,—This is the Season of Greetings and Gifts.

May I send to your readers Greetings and ask them to send to me Gifts?

These Greetings will, I hope, give real pleasure. They convey the gratitude of the soldiers blinded in the War for the sympathy and help which has come to them from all parts of the world. They carry the news that all we hoped for from the training given at St. Dunstan's is being justified by these blinded men in the very wonderful success that they are making of their lives.

I do not think that anyone would say it gets easier to be bravely blind as the years go on. It becomes easier to do things in the dark, but the demand on the will to keep pace with normal life grows greater rather than lessens. Constand effort is extraordinarily exacting, and it is really splendid how the men meet this demand on themselves, keep up their interest in everything and maintain their notable record as workers; some in offices, some practising as masseurs, some as poultry-farmers, and others as expert craftsmen.

There are still more than five hundred men learning to be blind in our class-rooms and workshops.

Besides those actually blinded on the battlefields, 23,000 men were discharged from the Army with seriously damaged sight, and unfortunately, many of these are finding it necessary to come to St. Dunstan's. We are dealing, too, with a number of men whose health does not enable them to make such quick progress as others. At the same time it becomes increasingly difficult to find for the men [illegible] suitable homes; there is the universal shortage of houses and a great scarcity of such small properties as the poultry-farmers need. Thus the difficulty and expense of setting the men has increased while we have to face enormously multiplied costs in providing for those who are our guests, in maintaining our convalescent and holiday homes, and in carrying on the ever-increasingly important work of the After-Care of the blinded soldiers.

We have also now to meet the expense of moving our head-quarters—the offices for the organization required to look after nearly 2,000 men, and also the classrooms and workshops. The House with its beautiful grounds so generously lent by Mr. Otto Kahn as a Hostel is no longer available: fortunately however, we have been able to find for our new quarters another house in Regent's Park—a place which for several generations has been the London Home of the Marquesses of Bute. The interior has been adapted for offices, and in the gardens the the class rooms and workshops have been re-erected. The place is near the Lake on which the blinded soldiers have taken so much pleasure in rowing, and both from the point of view of fresh air and of opportunities for unimpeded exercise the situation is ideal.

This starting again in the creation of a new training centre for the blinded soldiers has, however, been no small matter, and it adds to the reasons already referred to which prompt this appeal for the generous help of your readers.

The blinded soldiers have created a magnificent record; the plans for helping them back to normal life have worked out better, I think, than anyone dreamed would be possible. I think, too, there is no one who realises what the gift of sight means, and what blindness must mean, who would not wish to help on this work which St. Dunstan's has undertaken.

I trust that any of your readers who are so generous as to respond to this appeal will forward their contributions to me at St. Dunstan's Head-quarters, Regent's Park, London, N. W. I.

25th Nov. 1920.

Yours faithfully,
ARTHUR PEARSON,
Chairman—Blinded Soldiers' and Sailors' Care Committee.

BOOKS IN BRIEF.

India in 1919.—*A Report prepared for presentation for Parliament. By L. F. Rushbook Williams, Fellow of All Souls; Officer on Special Duty in the Home Department of the Government of India. Superintendent, Government Printing, India. Price Re. 1.*

Mr. Williams has again produced a readable report on the moral and material progress of India. It is a book that we desire every one to read for himself. Each reader may have his own views on Mr. William's account of the past year's record, but it is needless to add that Mr. Williams has given us a book full of information well digested by him. He lays emphasis on particular events and particular persons but that is a matter which each man will judge for himself. The chapter on the economic life of India (Chapter III) is one to which we would invite particular attention. It is both clear and succinct. On controversial topics Mr. Williams is not seen to the best advantage but that again is matter which might well be left to each reader. It is a book eminently to read and not to retail. The book is well printed and handy and is a marvel of cheapness at 1 Re per copy.

Income-tax—How to Avoid Overcharges and Obtain Repayments. *By A. D. Macmillan, formerly Surveyor of Taxes. Third Edition, 1920-21. Published by Mr. Effingham Wilson, 54. Threadneedle Street, London. Ec 2—Price 3sh net.*

We have pleasure in referring once again to Mr. Cunningham's practical book in these columns. The present edition deals from the standpoint of the 1920 Income-tax. The main Chapters as usual deal with (1) Causes of overcharge, (2) Classification of Incomes for Assessment, (3) Special Allowances from Assessed Income, (4) General allowances prior to 1920-21, (5) The 1920 Income-tax, (6) Connection and Repayment of overcharge, (7) Miscellaneous notes, and (8) Specimen cases of Repayment claims. We do not think that any further elaboration of its contents is necessary to point to the usefulness of this book. We have no doubt that it will be found useful for purposes for which it is intended to hit—how to avoid overpayments. Though our own Income-tax Act differs from the English Act, still the use of this book here by people assessed to Income-tax will enable them to easily avoid unnecessary overcharges and to obtain, without the aid of lawyers and accountants, overpayments made by them.

We have received from Messrs. Ganesh & Co., Madras "Songs of the Sea," an excellent book of poems by C. R. Das and Arabindaghose; some leaflets and pamphlets from the C. L. S. for India, Madras. Messrs. Ganesh & Co., Madras, have also sent us a copy of "Sea-Change," another book of poems by Mr. J. H. Cousins. There is much exquisite poetry in tiny this volume as well. We would specially refer to "A Passer-by" which is full of charm.

The Production and Consumption of Rice.—*Imperial Institute Report. Published by Mr. John Murray. 6 sh. net.*

In dealing with the problem of food supplies in the United Kingdom during the war, much attention was paid to the question of increasing the supplies of rice from British countries. In this connection the reports on the rice trade of India in relation to the rice resources of the world recently published by Mr. John Murray as the third volume of the reports of the Imperial Institute Indian Trade Enquiry are a mine of valuable information. The Indian Trade Enquiry was conducted by Special Committees appointed by the Committee for India of the Imperial Institute, at the instance of the Secretary of State for India, to investigate the possibility of increasing the trade of the United Kingdom and other parts of the Empire in Indian raw materials. In the present volume the results of the enquiries made by the Special Committee on Food-grains with regard to the Indian rice industry are embodied in a report on the Trade in Indian Rice, to which are appended two further reports on the Production and Uses of Rice and the Utilization of Burmese rice and its by-products, respectively. These latter reports comprise summaries of information prepared at the Imperial Institute for the Committee. In the main report reference is made to the two branches of the world's rice trade *viz.*, the far Eastern branch, requiring a cheap rice for feeding the native population; and the Western branch requiring large quantities of a medium quality rice and smaller quantities of a high quality product. The sources of supply of these markets are referred to, and sections are devoted to the following subjects; the world's trade in rice; the rice trade of India with the British Empire and with the Continent; imports, exports and home consumption of rice in European countries and the United States; the comparative cost of handling, milling and transporting rice in the United Kingdom and on the Continent. The industrial uses of rice are also dealt with and a series of statistical tables form an appendix to the report. In 1913, India (chiefly Burma), Siam and Indo-China together contributed 94 per cent of the world's exported surplus of rice (including paddy *i.e.* unhusked rice), the amount of the Indian exports

roughly equalling those from Indo-China and Siam combined. The total Indian export (2,450,000 tons) is approximately equivalent to the total requirements of the British Empire from the three chief exporting countries. From the point of view of a self-supporting Empire therefore it would appear possible for India to become the sole source of supply of rice to the Empire. Among the recommendations made by the Committee are suggestions for modifications in the headings of rice exports in the official Indian Trade Returns, with a view to tracing the development of the important rice milling industry of India. Since the report was made, alterations on the lines suggested have been made in the Indian Trade Returns. Certain changes in the headings of the rice exports in the Trade Returns of the United Kingdom are also suggested. The Committee also make recommendations for the regulation of foreign interests on the Indian rice trade, and the reconsideration of port charges and railway rates which at present constitute a severe handicap on the British rice trade in competition with the Continent.

Trade in Indian Oil-Seeds.—*Imperial Institute Report.—Published by Mr. John Murray—Price 6sh. net.*

The Report of the Indian Committee of the Imperial Institute on the trade of India in oil-seeds has been published by Mr. John Murray. The volume emphasises in a striking way the vast importance of the Indian oil-seed industry. The total annual production of oil-seeds of all kinds in India is probably well over 5,000,000 tons in quantity and £50,000,000 in value; in normal times approximately one-third of the output is exported. No other country produces in commercial quantities so great a variety of oil-seeds. Of the ten chief of these, *viz.*, linseed, ground nuts, cotton seed, rape seed, castor seed, sesame seed, copra, mowra seed, poppy seed and niger seed, India supplies no less than 30 per cent of the total amount entering commerce. Before the war about one-third of the total quantity of oil-seeds exported from India came to the United Kingdom, the chief kinds being cotton-seed, linseed and castor seed. Certain other oil-seeds, such as ground nuts, sesame, copra and mowra, were shipped mainly to France, Germany, and Belgium. Various suggestions are made by the Committee with a view to extending the trade in Indian oil-seeds with the United Kingdom and developing the British oil-seed crushing industry. It is considered that a free choice of the raw material produced within the Empire should be secured for this industry if necessary by a system of rationing and licensing in the producing country. If further assistance is required an import duty should be imposed on oils and fats of all kinds imported into the United Kingdom from foreign countries. The Committee consider that the latter method would be more satisfactory than a preferential export duty on Indian oil-seeds. A memorandum on the effect of import tariffs on the oil-seed crushing industry, by Mr. J. W. Pearson, Chairman of the Seed-Crushers' Association of the United Kingdom is appended to the Report. The volume also contains a detailed account of the Indian trade in oil-seeds, prepared at the Imperial Institute for the Committee.

INDIAN TANSTUFFS.

The Board of Industries and Munitions have issued a monograph on Indian Tanstuffs by Mr. J. A. Pilgrim, M.S.L.T.C., Tannin Expert to the Government of India (Superintendent, Government Printing, India, Calcutta, Six annas). The following prefatory note by the author gives an idea of the scope of the work :—

During the period May to November, 1918, a number of tanstuffs underwent laboratory examination at Maihar, and a good many of these were further tested in the tannery connected with the Government Tannin Research Factory, on a practical scale. The practical tests having been carried out under the Directorship of Mr. W. A. Fraymouth, Director of the Tannin Research Factory, by various members of staff, they were not actually under the control of the present writer, though he had the opportunity of studying the work done in the tannery. In the meantime he was responsible rather for the initial laboratory work, and no account of the investigations undertaken having been as yet published, he has been asked to give a resumé—primarily of the work done by himself and his staff. It should, however, be noted that many of the samples examined by the writer during the period under review were done with samples which he had not personally collected, and that no investigator can guarantee absolutely that the results obtained in his analyses accurately represent the true average for the species in question, except where he himself has also been responsible for the taking of the average samples. Many samples examined were received by post or rail, having come very long distances, and though it has, in the past, been his endeavour to make it plain as to how samples of tanning materials ought to be collected in order to give the best results, yet, the writer cannot, without definite knowledge of the fact, feel entirely satisfied that proper methods of selections and collection have in every case a actually been applied. Under the head of many of the tanstuffs referred to in the succeeding pages, particulars of the size of sample have been given over the analysis figures of the tanning material in question.

The results of analyses have all been expressed, calculated to the *absolutely dry* raw tanning material, this being the only satisfactory means of comparing one with another, as also with the analyses of other tanning materials and extracts. The moisture content in air-dry raw tanning materials varies considerably, both according to the nature of the material, and also to the conditions of weather prevailing at the particular time. Ten per cent of moisture is, however, a prettey fair average in many

parts of India. In Central India, the district where the samples referred to in this paper were analysed, in dry weather the moisture often goes down to 5 to 6 per cent air-dry, although during the rains it may be anything from 10 to even 12 per cent. The writes has, speaking generally, in his calculations of yield of extract from air-dry tanning material, taken figures for moisture content somewhat in excess of those found by analysis. He has, however, in almost every individual case, mentioned the amount of moisture he has actually allowed for in the air-dry bark in his calculations of yield. In addition to the yield, in the case of tanstuffs promising from the point of view of extract manufacture, he has also given figures for the calculated, *i.e.*, theoretical maximum possible percentage of tannin. This figure has been based upon the proportion of tannins to soluble non-tannins. It does not take account of those substances soluble in a hot extract liquor, but becoming insoluble on cooling, of which a certain proportion are removed from most raw tanning materials. It therefore represents the ideal where no such difficultly soluble bodies are present, and where there is no production of such during the concentration in the vacuum pan. Speaking generally, the actually percentage of tannin in the finished commercial product is likely to be at least some 5 per cent below the ideal figure.

In the present paper, the yield of extract from any given tanstuff has in almost every instance been expressed in terms of the so-called "crystals". "Crystals" are now a recognized commercial form of tannin extracts. They represent in actual effect, the broken-up scale produced in the film type of of final concentrator, and contain on an average about 5 per cent of moisture.

It should be mentioned that the various tanstuffs have been dealt with, as usual, in their botanical order.

THE EGYPTIAN ADMINISTRATION REPORTS.

The Reports of H. M. High Commissioner on the Finances, Administration and Condition of Egypt and the Soudan for the period 1914-1919 (cmd. 957) issued recently, there is a reference to the proposed State University to be established in Egypt under the heading "Education," a sectional Report says :—Educational developments have now reached a stage which makes it possible, and very desirable, to consider as a practical question the establishment of a State University. . . The existing colleges furnish no opportunity for students, after completing their secondary course to secure a liberal education apart from a professional career ; the complete separation of the courses makes the present organization of higher education inelastic, leaving little opportunity for optional studies or for different combinations of courses, and insufficient provision and incentive exist for post-graduate studies or original research. In short, the present organization insufficiently sets forth high ideals, has developed no academic traditions, and is too exclusively utilitarian. It tends to foster the belief that the obtaining of a diploma is the one and only purpose to be kept in view, and fails to evoke the true spirit of culture—the pursuit of learning for its own sake. . . . While there is need for the expansion of the existing professional colleges, an effort should be made at the same time to meet the requirements of those . . . who wish to pursue a higher course of study for the sake of general culture, without reference to any particular profession or career. Further, the long and varied history of Egypt, as well as its geographical situation and its position in the Moslem world, clearly point to the appropriateness of Cairo as a seat for a college of Oriental studies. At present Egypt, in spite of incomparable advantages, provides no opportunities (such as exist in the most important European universities) for acquiring a literary knowledge of the languages that are cognate with Arabic and of the comparative philology of the Semitic languages of Ancient Egypt, or for the investigation of the many literary, archæological, historical, and philosophical questions on which these studies throw light. The time has come for the creation of higher courses of study of the true university type. . . A commission was appointed by Sir Adly Yeghen Pasha in 1917 to consider this question. In 1918 it presented a preliminary report, but no effective steps were taken thereupon. The question is now being pressed forward with a view to early effect being given to the proposals.

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ACKNOWLEDGMENTS.

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Reports on Rice. *Indian Trade Enquiry. Imperial Institute, London. John Murray, Albemarle Street, W. 1920. Price 6s. net.*

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Report on the Lawrence Gardens, Lahore, for the year 1919-20, Lahore. *Printed by the Superintendent, Government Printing, Punjab, 1920. Price As. 2 or 3d.*